

CHAPTER 2

The Nature and Extent of Underage Drinking in America

STOP Act Requirements for the Report to Congress

The STOP Act requires the HHS Secretary to report to Congress on the “extent of progress in preventing and reducing underage drinking nationally.”

The report is to include:

- Patterns of underage consumption as described in research, including federal surveys.
- Information on the onset and prevalence of underage drinking.
- Measures of the availability of alcohol and the means of underage access.
- Measures of the exposure of underage populations to messages regarding alcohol in advertising and entertainment media as reported by the Federal Trade Commission (FTC).

This chapter sets out detailed updates in response to this mandate.

Federal Surveys Used in This Report

Progress on reducing underage drinking and current status on consumption is monitored through three major national surveys funded by the federal government that collect data on, among other topics, underage drinking and its consequences:

- The annual National Survey on Drug Use and Health (NSDUH; formerly called the National Household Survey on Drug Abuse)
- The annual Monitoring the Future (MTF) survey (conducted pursuant to federal grants)
- The biennial Youth Risk Behavior Survey (YRBS)

Key findings from these data sources and other research related to underage alcohol use in the United States are described in this chapter.¹⁰

Each survey makes a unique contribution to an understanding of the nature of alcohol use, and each survey was developed for a specific purpose. However, direct comparison of findings across the three surveys (e.g., in the prevalence of underage drinking) is not generally appropriate because each survey has a unique design and a different sampling frame and weighting approach (see, e.g., Cowan, 2001). The only overlap in the survey populations sampled is students in the 10th and 12th grades in traditional schools in 47 states (Exhibit 2.1).

Because the surveys use varied data collection methods (e.g., Chen, Yoon, & Faden, 2017; Fendrich & Johnson, 2001; Harrison, 2001), each provides a different perspective on the status of underage drinking. For consistency in reporting, detailed statistics from the survey most appropriate to address the topic of interest are provided in the main text of this report; supporting, contrasting, and supplementary data from the other surveys are also provided when appropriate.

These surveys are revised periodically to reflect the current state of the research in underage drinking. In 2015, the NSDUH definition of binge drinking was changed from five drinks on a

¹⁰Four additional surveys used by the government to obtain data on underage persons (ages 18 and older) who drink are the Behavioral Risk Factor Surveillance System (BRFSS), National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), National Health Interview Survey (NHIS), and Survey of Health-Related Behaviors Among Active Duty Military Personnel (HRB; formerly called the Worldwide Survey of Substance Abuse and Health Behaviors Among Military Personnel). Appendix B provides a more detailed description of each of these surveys and their unique contribution to research.

single occasion to five drinks for males or four drinks for females. This change was made to reflect the evidence that there are differences in how alcohol is processed by males and females. Trend data for female and total binge drinking through 2015 are therefore not currently available (Center for Behavioral Health Statistics and Quality [CBHSQ], 2017b).

Exhibit 2.1: Summary of Major Federal Surveys Assessing Underage Drinking¹¹

Survey/ Sponsoring Agency	Purpose	Target Population	Administration Schedule	Data Collection Method
National Survey on Drug Use and Health (NSDUH)–SAMHSA Center for Behavioral Health Statistics and Quality (CBHSQ)	Measurement of substance use, misuse, and related problems for U.S. population ages 12–65	Civilian, noninstitutionalized population ages 12–65 in the U.S. Group homes, shelters, etc., included.	Annually since 1991	In-person visit to home; audio computer-assisted self-interviews
Monitoring the Future (MTF) ¹² –NIDA	Measurement of alcohol, tobacco, and other drug use by secondary school students	Secondary school students in coterminous U.S. in grades 8, 10, and 12; a randomly selected sample from each senior class has been followed up biannually after high school on a continuing basis.	Annually for 12th graders since 1975 and for 8th and 10th graders since 1991; biannually for college students and adults ages 19–20 (and through 55)	School-based, self-administered questionnaire in classroom
Youth Risk Behavior Survey (YRBS)–CDC	Assessment of a variety of behaviors that affect adolescent health	Public, Catholic, and other private school students in grades 9–12 in the U.S. and the District of Columbia (excluding most of Louisiana)	Biennially since 1991	School-based, self-administered questionnaire in classroom

Extent of Progress

Progress in the reduction of underage drinking is assessed both by examining drinking behavior directly and by assessing changes in behaviors and outcomes that are correlated with underage drinking. An examination of trend data across the three federally sponsored surveys suggests that meaningful progress is being made in reducing the extent of underage drinking, including overall alcohol use, age of initiation, and binge drinking. Progress is also being made in reducing driving after drinking. In addition, there has been a steady decline in past-year alcohol use disorder among 12- to 20-year-olds.

Extent of Progress: Alcohol Use

Exhibits 2.2 and 2.3 provide NSDUH-based estimates of trends of alcohol use in two key areas—current use and age at first use—from 2004 (when the Interagency Coordinating Committee on the Prevention of Underage Drinking [ICCPUD] was first convened) through 2016.¹³ Exhibit 2.4 provides NSDUH-based estimates of binge drinking, a third key area, from 2015 to 2016.

¹¹See Chen, Yoon, & Faden (2017) for details on differences in the surveys.

¹²For comparability with 2016 NSDUH (the most recent data available as this report was being prepared), the latest MTF data included in this report are also from 2016. The 2017 MTF data became available in December 2017 and will be included in the next report.

¹³2006–2010 estimates are based on data files revised in March 2012.

All age groups showed a statistically significant decline in past-month alcohol use over time. As shown in the last columns in Exhibit 2.2, declines have been substantial for most age groups. Not unexpectedly, changes among 18- to 20-year-olds were smaller but still statistically significant. The large number of 18- to 20-year-olds using alcohol also accounts for the smaller percentage change among 12- to 20-year-olds compared with 12- to 17-year-olds.¹⁴

**Exhibit 2.2: Past-Month Alcohol Use for 12- to 20-Year-Olds:
2004–2016 NSDUH Data (CBHSQ, 2017c)¹⁵**

Age	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	% Change 2004 2016
12–13	4.3%	4.2%	3.9%	3.5%*	3.4%*	3.5%*	3.2%*	2.5%*	2.2%*	2.1%*	2.1%*	1.3%*	1.4%*	-66.5%
14–15	16.4%	15.1%	15.6%	14.7%*	13.3%*	13.1%*	12.4%*	11.3%*	11.1%*	9.5%*	8.5%*	7.4%*	7.9%*	-52.2%
16–17	32.5%	30.1%*	29.8%*	29.2%*	26.3%*	26.5%*	24.6%*	25.3%*	24.8%*	22.7%*	23.3%*	19.7%*	17.7%*	-45.8%
18–20	51.1%	51.1%	51.6%	50.8%	48.6%*	49.5%	48.5%*	46.8%*	45.8%*	43.8%*	44.2%*	40.9%*	39.1%*	-23.2%
12–17	17.6%	16.5%*	16.7%*	16.0%*	14.7%*	14.8%*	13.6%*	13.3%*	12.9%*	11.6%*	11.5%*	9.6%*	9.2%*	-47.8%
12–20	28.7%	28.2%	28.4%	28.0%	26.5%*	27.2%*	26.2%*	25.1%*	24.3%*	22.7%*	22.8%*	20.3%*	19.3%*	-32.9%

*Difference between 2004 estimate and this estimate is statistically significant at the 0.05 level.

As shown in Exhibit 2.3, among past-year initiates¹⁶ of alcohol use who initiated before age 21, the overall trend in the mean age at first alcohol use went up from 15.6 in 2004 to 16.2 in 2016 with significant increases since 2006. This indicates a delay in initiation of drinking. Trends in age of initiation of alcohol use are important to follow because delaying the age of first alcohol use can ameliorate some of the negative consequences of underage alcohol consumption (CBHSQ, 2017c).

**Exhibit 2.3: Average Age at First Use Among Past-Year Initiates of Alcohol Use
Who Initiated Before Age 21: 2004–2016 NSDUH Data (CBHSQ, 2017c)**

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Average Age at First Use	15.6	15.6	15.8*	15.8*	15.8*	15.9*	16.0*	15.9*	16.0*	16.2*	16.2*	16.3*	16.2*

*Difference between 2004 estimate and this estimate is statistically significant at the 0.05 level.

Appendix B further discusses methodological issues in measuring age at first use and other indicators of alcohol initiation. NSDUH data for binge-drinking levels, the third key area of progress in alcohol use, is shown in Exhibit 2.4. There was a significant decline overall (ages 12 to 20) and in three of the five age subgroups (12 to 13; 16 to 17; and 12 to 17) for binge drinking in 2016 compared with 2015.¹⁷

¹⁴CBHSQ provided special analyses of NSDUH data for this report.

¹⁵Based upon CBHSQ-provided special analyses of NSDUH data.

¹⁶Past-year initiates are those who drank alcohol for the first time in their lives in the 12 months before the survey interview.

¹⁷NSDUH questionnaire changes for 2015 included a revision of the definition of binge drinking for females from five to four drinks; therefore, data for males and females combined for 2015 cannot be compared with those from previous years.

**Exhibit 2.4: Past-Month Binge Alcohol Use for 12- to 20-Year-Olds:
2015–2016 NSDUH Data (CBHSQ, 2017c)**

Age	2015	2016	% Change 2015 2016
12–13	0.7	0.3*	-52.7%
14–15	3.8	3.7	-1.9%
16–17	12.6	10.2*	-18.8%
18–20	27.4	26.3	-6.1%
12–17	5.8	4.9*	-15.8%
12–20	13.3	12.1*	-9.6%

*Difference between 2015 estimate and this estimate is statistically significant at the 0.05 level.

Similarly, MTF trend data among students in grades 8, 10, and 12 indicate binge drinking¹⁸ increased slightly in the 1990s, leveled off in the early 2000s, and then began a gradual decline in 2002. Two recent publications provide a detailed analysis of this trend (Esser, Clayton, Demissie, Kanny, & Brewer, 2017; Jang, Patrick, Keyes, Hamilton, & Schulenberg, 2017). Declines in binge drinking have continued as shown by data recorded in 2016, which marks the lowest levels in all three grades measured by the MTF survey.

The authors note that the declines in binge drinking from 1991 to 2016 are quite substantial, with 8th graders declining by 70 percent, 10th graders by 50 percent, and 12th graders by 30 percent (Johnston, O'Malley, Miech, Bachman, & Schulenberg, 2017b).

Analyses of multiple surveys through 2009 (Chen, Yi, & Faden, 2011; Faden & Fay, 2004) and then through 2013 (Chen, Yi, & Faden, 2015) confirm the patterns described above.

Extent of Progress: Driving After Drinking

One important sign of progress in addressing underage drinking is that alcohol-related traffic deaths among young drivers ages 15 to 20 have declined 82 percent since 1982 (NCSA, 2017). However, the 2016 NSDUH survey indicates that 5.1 percent of youths ages 16 to 20 reported driving after drinking at least once in the past year (CBHSQ, 2017a).

Using MTF data, O'Malley and Johnston (2013) reported, and have subsequently updated through annual special analyses, longitudinal data for high school seniors who reported any of the following behaviors in the past two weeks: driving after drinking any alcohol; driving after five or more drinks; being a passenger when the driver has had any alcohol; or being a passenger with a driver who has had five or more drinks (Exhibit 2.5). As demonstrated in Exhibit 2.5, all four of these behaviors have declined in the last decade, but they remain unacceptably high, especially given the risks associated with driving after even small amounts of alcohol.

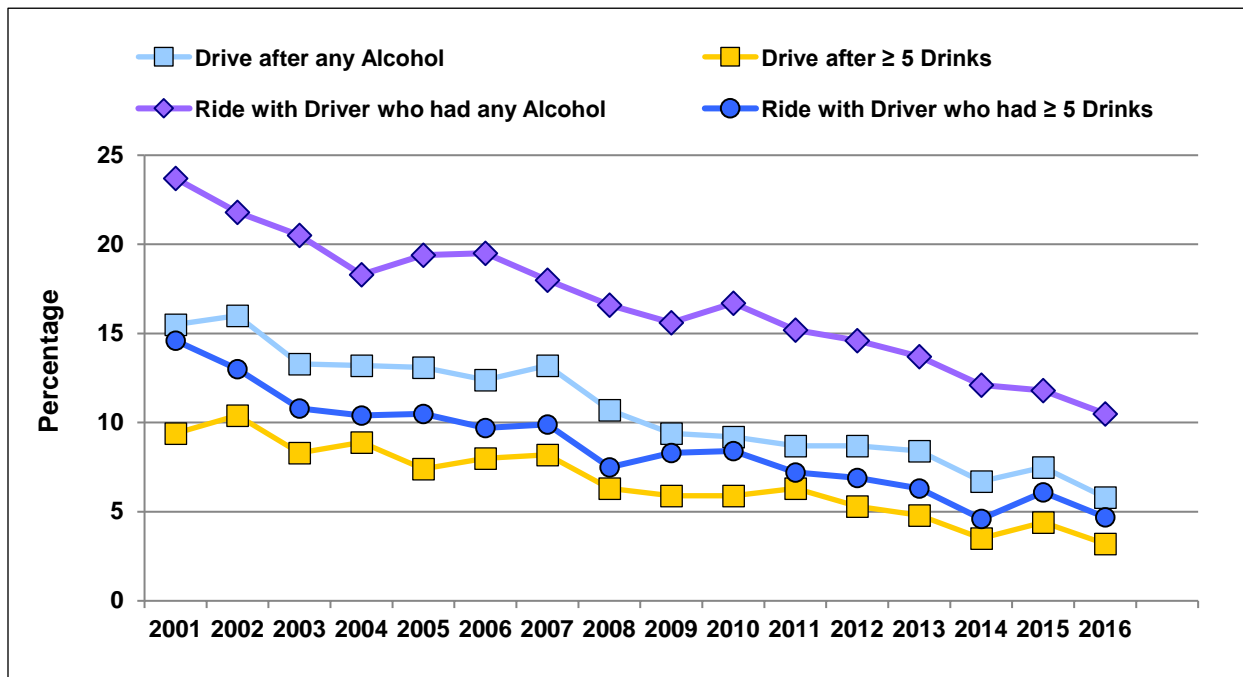
Males were more than twice as likely as females to report driving after five or more drinks, a finding replicated in other studies (Quinn & Fromme, 2012a; "Teen Drivers," 2017). Very high percentages of high school seniors who drove after drinking five or more drinks experienced

¹⁸Binge drinking in the MTF survey is defined as five drinks for both males and females.

consequences. O’Malley and Johnston (2013) reported that 43.2 percent received a ticket or warning and 30.2 percent were involved in a crash.

O’Malley and Johnston (2013) note that high school seniors who drive more frequently are more likely to drive after drinking. Driving after drinking in college students is associated with living off campus (Quinn & Fromme, 2012b), spending more evenings out (O’Malley & Johnston, 2013), higher socioeconomic status, and driving someone’s car without permission (Delcher, Johnson, & Maldonado-Molina, 2013).

Exhibit 2.5: Trends in Percentage of 12th Graders Reporting Driving after Alcohol Use or Riding after Alcohol Use by the Driver: 2016 MTF Data
(O’Malley & Johnston, 2013; O’Malley, 2017)¹⁹



A number of policy approaches have been shown to reduce driving after drinking and associated mortality and morbidity among youth. Chief among these is the age-21 minimum legal drinking age (MLDA). Two reviews of the research on the age-21 MLDA concluded that this policy reduces injuries and saves lives, even though the law is imperfectly enforced and widely disobeyed (DeJong & Blanchette, 2014; McCartt, Hellinga, & Kirley, 2010). Fell, Scherer, Thomas, and Voas (2016) found that the age-21 MLDA was associated with a 4 to 8 percent decline in the ratio of drinking to nondrinking drivers under age 21 involved in fatal crashes, after controlling for other state-level traffic safety and alcohol-related policies. Another study examining the effects of a variety of laws designed to reduce driving after drinking found significant effects of laws related to underage purchase and consumption as well as to production and use of false identification (Fell, Fisher, Voas, Blackman, & Tippetts, 2008).

¹⁹Updates to 2012 report have been provided annually by Patrick O’Malley (O’Malley, 2017).

Policies targeting young people’s drinking and driving behavior may also be factors in the trend of reduction in traffic fatalities. (These policies are discussed in more detail in the State Performance and Best Practices.) Graduated driver’s license (GDL) policies limit the extent to which young people drive and the conditions under which they drive. “Use/lose” policies revoke driving privileges of young people convicted of an alcohol offense. Cavazos-Rehg and colleagues (2012) used 1999–2009 YRBS data to examine the impact of GDL and “use/lose” laws on drinking and driving behaviors of youth ages 16 to 17. They found that restrictive GDL laws and “use/lose” laws were associated with decreased driving after drinking any alcohol and decreased riding in a car with a driver who had been drinking alcohol (Cavazos-Rehg et al., 2012).

Extent of Progress: Prevalence of DSM-IV-TR Alcohol Abuse and Dependence Among Youth

There was a significant decline in past-year alcohol use disorder from 2004 to 2016 as defined by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*²⁰ (DSM-IV-TR; American Psychiatric Association [APA], 2000) for all age groups, and for both males and females. Trends in DSM-IV-TR alcohol use disorders (abuse and dependence) among people ages 12 to 20 from 2004 to 2016 are provided in Exhibit 2.6. Nonetheless, the prevalence of DSM-IV-TR alcohol abuse and dependence among underage drinkers remains quite high.

As shown in Exhibit 2.7, according to combined 2015–2016 NSDUH data, about 8.5 percent (or 1 in 12) 18- to 20-year-olds met criteria for DSM-IV-TR alcohol abuse or dependence. The prevalence rate for 18- to 20-year-olds is significantly lower than for 21- to 24-year-olds (12.4 percent) and 25- to 29-year-olds (10.1 percent), but not significantly different than for 30- to 34-year-olds (8.6 percent). In addition, 0.6 percent of 12- to 14-year-olds and 3.8 percent of 15- to 17-year-olds met criteria for DSM-IV alcohol abuse or dependence (CBHSQ, 2017c). The prevalence of alcohol abuse or dependence as defined by DSM-IV-TR is highest among those ages 21–29 (Exhibit 2.7).

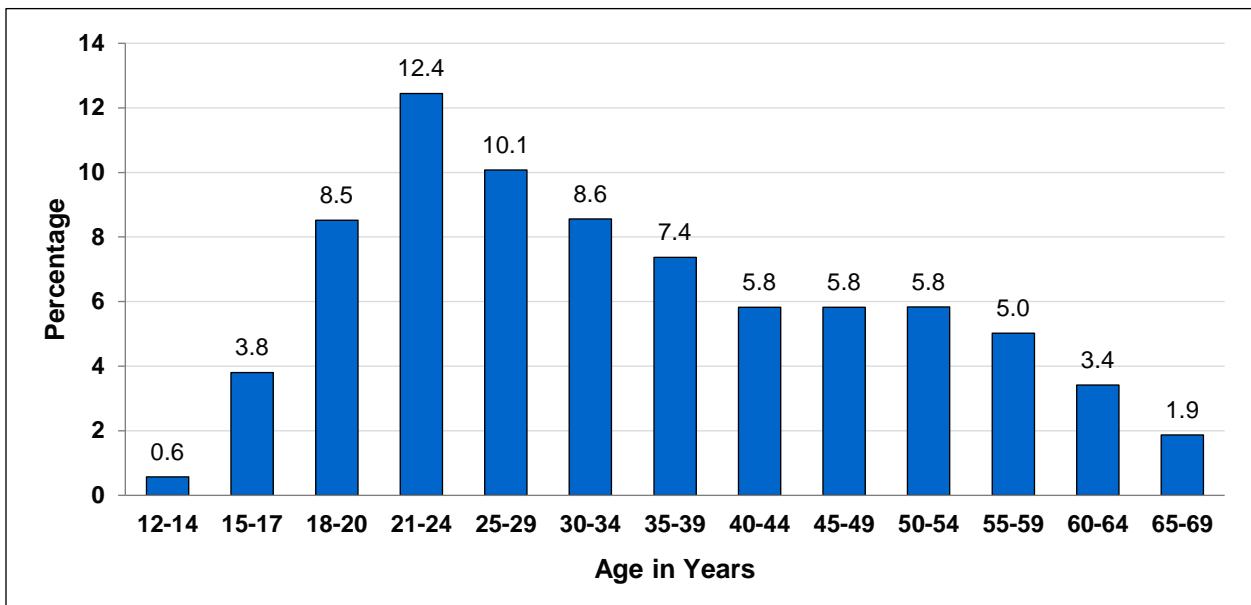
²⁰The DSM-IV-TR (APA, 2000) criteria for abuse and dependence used in this study were originally developed for use with adults, and using them to assess abuse and dependence in adolescents may lead to inconsistencies. The more recent *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-V; APA, 2013) integrates the two DSM-IV disorders, alcohol abuse and alcohol dependence, into a single disorder called alcohol use disorder (AUD). DSM-V does not specifically address adolescents. Research suggests that the criteria for DSM-V and the criteria for DSM-IV would result in similar outcomes (Winters, Martin, & Chung, 2011).

Exhibit 2.6 Past-Year DSM-IV-TR Alcohol Abuse or Dependence for 12- to 20-Year-Olds, by Age and Sex: 2004–2016 NSDUH Data (CBHSQ, 2017c)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	% change 2004–16	p value for the overall trend
Ages 12–20	9.6	9.4	9.1	9	8.9*	8.2*	8.0*	7.1*	6.6*	5.6*	5.1*	4.7*	4.1*	-57.4%	<0.001
Ages 12–17	6.0	5.5	5.4*	5.4*	4.9*	4.6*	4.6*	3.8*	3.4*	2.8*	2.7*	2.5*	2.0*	-67.4%	<0.001
Ages 18–20	16.8	16.9	16.5	15.8	16.4	14.7*	14.0*	13.1*	12.5*	11.0*	9.7*	8.8*	8.2*	-51.0%	<0.001
Males ages 12–20	10.8	10	9.6*	9.8*	9.5*	8.9*	8.7*	7.2*	6.5*	5.8*	5.2*	4.5*	3.7*	-65.9%	<0.001
Females ages 12–20	8.3	8.7	8.5	8.1	8.3	7.6	7.2*	6.9*	6.6*	5.4*	5.1*	4.8*	4.5*	-45.8%	<0.001

*Difference between 2004 estimate and this estimate is statistically significant at the 0.05 level.

Exhibit 2.7: Prevalence of Past-Year DSM-IV-TR Alcohol Abuse or Dependence by Age: 2015–2016 NSDUH Data (CBHSQ, 2017c)



Summary of Progress

The above data demonstrate that meaningful progress has been made in reducing underage drinking prevalence, DSM-IV-TR alcohol abuse and dependence disorders, and related problems such as traffic fatalities. Factors that have contributed to this progress are varied and complex; however, one clear factor has been increased attention to this issue at all levels of society. Federal initiatives have lifted underage drinking to a prominent place on the national public health agenda, created a policy climate in which significant legislation has been passed by states and localities, raised awareness of the importance of aggressive enforcement, and stimulated coordinated citizen action. These changes are mutually reinforcing and have provided a framework for a sustained national commitment to reducing underage drinking.

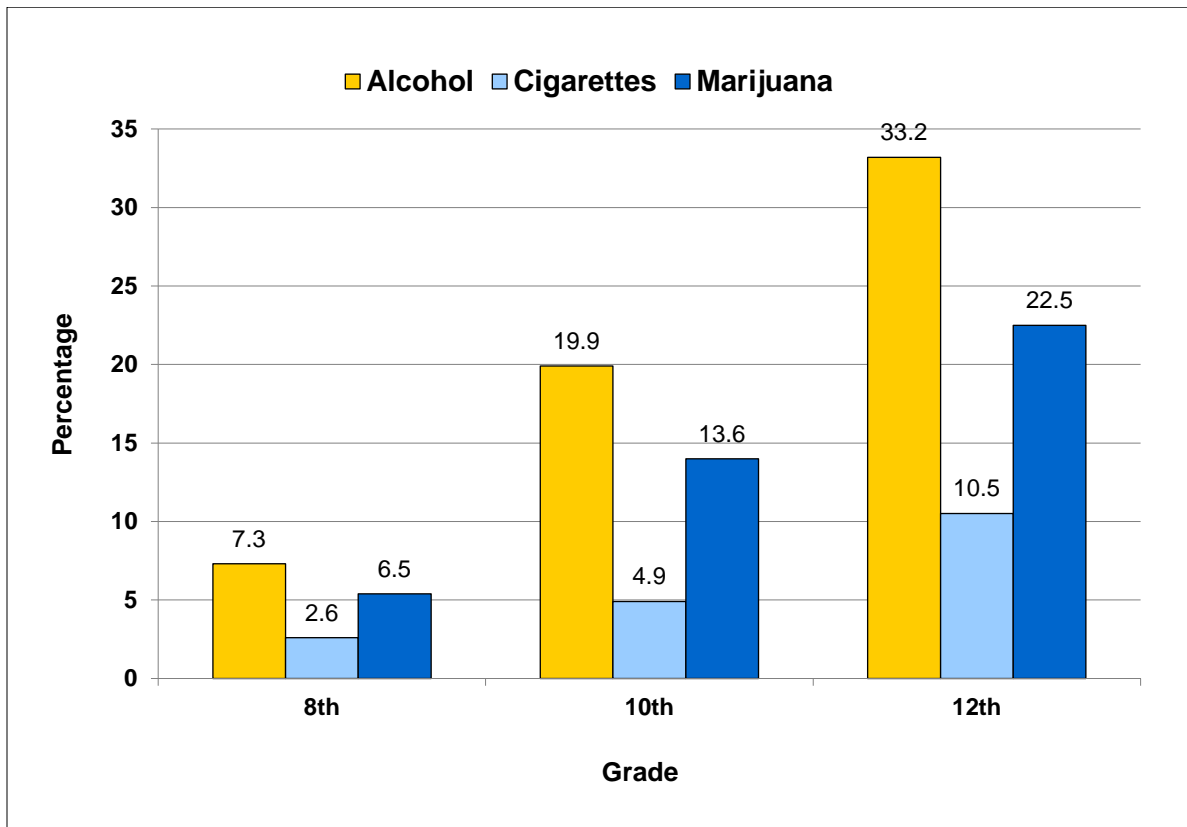
Patterns of Consumption

Despite progress, underage alcohol use in the United States continues to be a widespread and serious problem, the consequences of which remain a substantial threat to public health. Rates of underage drinking are still unacceptably high, resulting in preventable and tragic health and safety consequences for the nation's youth, families, communities, and society. Therefore, ICCPUD remains committed to an ongoing, comprehensive approach to preventing and reducing underage drinking. This report, along with the yearly updates to state reports and survey responses, is part of that sustained effort to continue to reduce underage drinking in America.

Alcohol continues to be the most widely used substance of misuse among American youth (CBHSQ, 2017a; Miech et al., 2017).

According to CBHSQ, through special analyses of NSDUH 2016 data, a higher percentage of youth who are 12 to 20 years old used alcohol in the past month (19.3 percent) than tobacco (12.3 percent) or illicit drugs (13.3 percent; CBHSQ, 2017c). Similarly, as shown in Exhibit 2.8, based on MTF data, a higher percentage of youth in grades 8, 10, and 12 used alcohol in the month prior to being surveyed than used marijuana (the illicit drug most commonly used by adolescents) or tobacco (Miech et al., 2017).

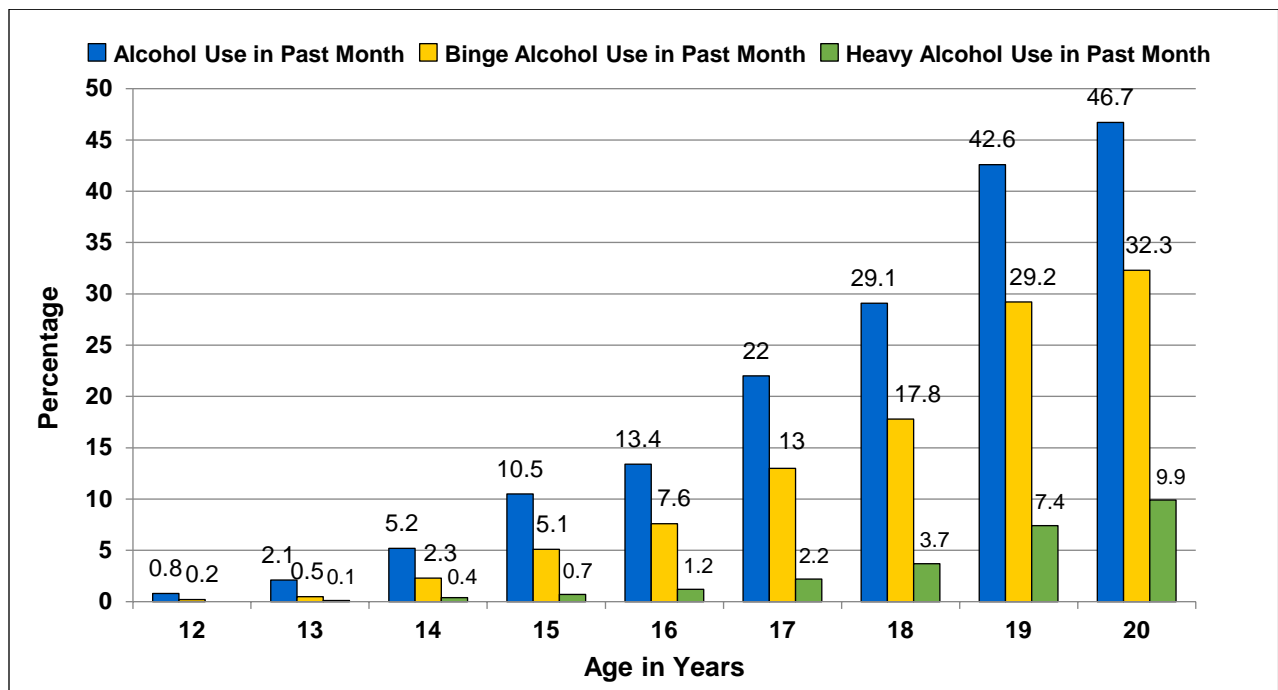
Exhibit 2.8: Past-Month Adolescent Alcohol, Cigarette, and Marijuana Use by Grade: 2016 MTF Data (Miech et al., 2017)



Underage alcohol consumption rates can be viewed from several perspectives, as detailed below:

- **Lifetime Use:** Data from the 2016 NSDUH indicate that 41.0 percent of those ages 12 to 20 have had alcohol (more than a sip) in their lifetime (CHBSQ, 2017a).
- **Current Use:** The 2016 NSDUH reported that approximately 19.3 percent of Americans ages 12 to 20 (about 7.7 million people) reported having at least one drink in the 30 days prior to the survey interview (CBHSQ, 2017a).
- **Binge Drinking:** Among underage drinkers (12- to 20-year-olds), 12.1 percent (4.5 million) engaged in binge drinking (five or more drinks for males or four or more for females on the same occasion, either at the same time or within a few hours) on at least 1 day in the past 30 days. Binge drinking was reported at all ages, with frequency increasing by age (see Exhibit 2.9; CBHSQ, 2017a).
- **Heavy Drinking:** Approximately 2.8 percent of this age group (1.1 million) are heavy drinkers (consuming five or more drinks on the same occasion on each of 5 or more days in the past 30 days). By definition, all heavy alcohol users are also binge alcohol users (CBHSQ, 2017a).
- **Geographic Extent of Use:** Current consumption by underage individuals varies slightly by region, with reports of consumption by those ages 12 to 20 at 23.7 percent in the Northeast, 20.8 percent in the Midwest, 17.6 percent in the South, and 17.6 percent in the West (CBHSQ, 2017a).

Exhibit 2.9: Current, Binge, and Heavy Alcohol Use Among People Ages 12–20 by Age: 2016 NSDUH Data (CBHSQ, 2017a)



Onset and Prevalence

Drinking often begins at very young ages. The NSDUH survey (CBHSQ, 2017c) indicates that approximately:

- 13.3 percent of lifetime alcohol users ages 12 to 20 began drinking before age 13.
- 11.0 percent of past-year alcohol users ages 12 to 20 began drinking before age 13.

Similarly, YRBS data shows that almost one-fifth (17.2 percent) of underage drinkers in high schools begin drinking before age 13 (Kann et al., 2016).

The average age of first use for youth who initiated before age 21 is about 16.2 years old. However, among those who initiated alcohol use in the past year, 759,000 reported being ages 12 to 14 when they initiated. This means that for every day in 2016, approximately 2,078 youths (12 to 14 years of age) drank alcohol for the first time (CBHSQ, 2017c).

Youth who report drinking before age 15 are more likely to experience problems, including intentional and unintentional injury to self and others after drinking (Hingson, Heeren, Jamanka, & Howland, 2000; Hingson & Zha, 2009); violent behavior, including predatory and dating violence (Blitstein, Murray, Lytle, Birnbaum, & Perry, 2005; Ellickson, Tucker, & Klein, 2003; Ramisetty-Mikler, Caetano, Goebert, & Nishimura, 2004, 2006); criminal behavior (Eaton, Davis, Barrios, Brener, & Noonan, 2007); prescription drug misuse (Hermos, Winter, Heeren, & Hingson, 2008); unplanned and unprotected sex (Hingson, Heeren, Winter, & Wechsler, 2003); motor vehicle crashes (Hingson, Heeren, Levenson, Jamanka, & Voas, 2002); and physical fights (Hingson, Heeren, & Zakocs, 2001).

Early-onset drinking is a marker for future problems, including heavier use of alcohol and drugs during adolescence (Buchmann et al., 2009; Hawkins et al., 1997; Liang & Chikritzhs, 2015; Robins & Przybeck, 1985) and alcohol dependence in adulthood (Grant & Dawson, 1998). Delaying the age of first alcohol use can ameliorate some of the negative consequences of underage alcohol consumption, which means that trends in age of initiation of alcohol use are important to follow.

Supporting Data

Ever Used Alcohol

MTF: 61.2 percent of 12th graders, 43.4 percent of 10th graders, and 22.8 percent of 8th graders have had alcohol at some point in their lives (Exhibit 2.10, Miech et al., 2017).

YRBS: 63.2 percent of students have had at least one drink of alcohol on at least 1 day in their lives (Kann et al., 2016).

Current Use of Alcohol

MTF: 33.2 percent of 12th graders; 19.9 percent of 10th graders; and 7.3 percent of 8th graders report having had at least one drink in the 30 days before the survey (Miech et al., 2017).

YRBS: 32.8 percent of students reported having had at least one drink in the 30 days before the survey.

Binge and Heavy Use of Alcohol

MTF: 46.3 percent of 12th graders, 26.0 percent of 10th graders, and 8.6 percent of 8th graders reported having been drunk at least once (Exhibit 2.10; Miech et al., 2017).

MTF: 15.5 percent of 12th graders, 9.7 percent of 10th graders, and 3.4 percent of 8th graders reported consuming five or more drinks in a row in the 2 weeks prior to the survey (Miech et al., 2017).

YRBS: 17.7 percent of students reported five or more drinks in a row in the 30 days prior to the survey (Kann et al., 2016).

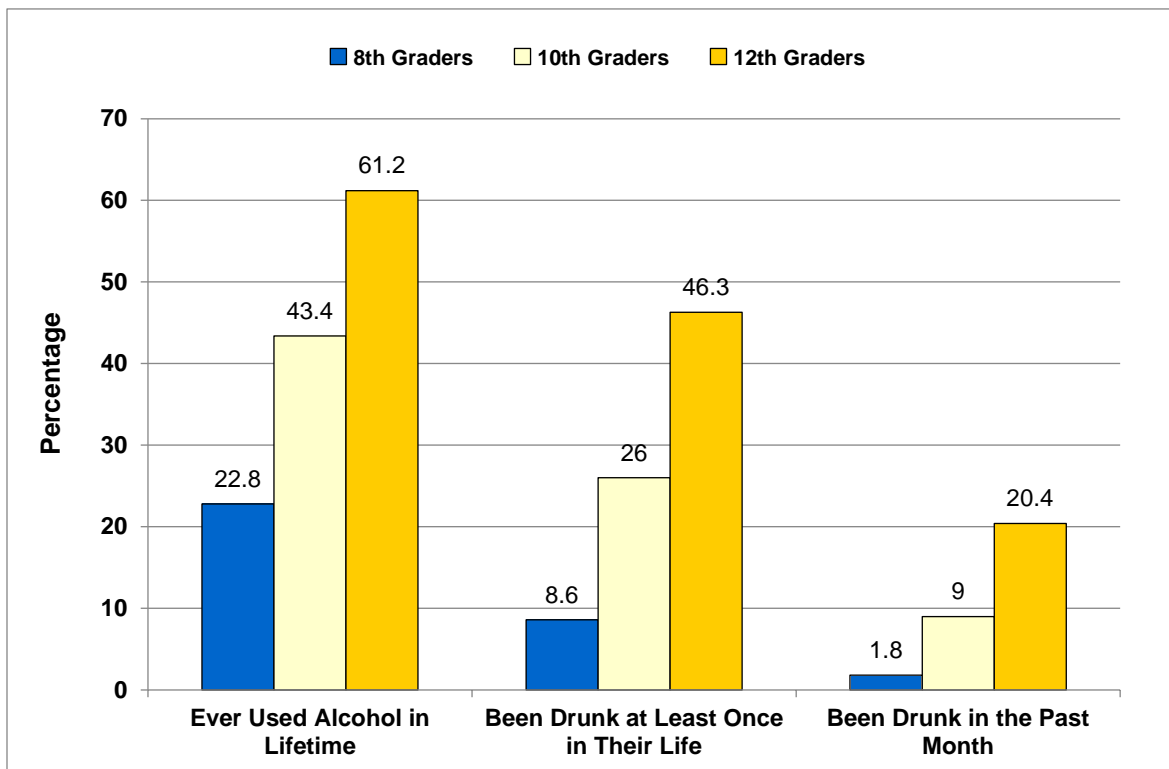
Appendix B further discusses methodological issues in measuring age at first use and other indicators of alcohol initiation.

Alcohol Use and Binge Drinking Increase with Age

Drinking becomes increasingly common through the teenage years (O’Malley, Johnston, & Bachman, 1998). Frequent, heavy use by underage drinkers also increases each year from age 12 to age 20 (Flewelling, Paschall, & Ringwalt, 2004). The 2016 NSDUH reported that underage alcohol consumption in the past month increased with age from 0.8 percent for 12-year-olds to 46.7 percent for 20-year-olds. Past-month alcohol consumption across all age groups peaked at 69.3 percent for 23-year-olds (CBHSQ, 2017a).

Binge drinking also increased steadily between ages 12 and 20 (Exhibit 2.9), peaked at age 21 (46.8 percent), and then decreased beyond young adulthood (data not shown). Approximately 4.5 million (12.1 percent) of 12- to 20-year-olds reported past-month binge alcohol use (CBHSQ, 2017a).

Exhibit 2.10: Lifetime Alcohol Use, Lifetime Use to Intoxication, and Use to Intoxication Within the Past Month among 8th, 10th, and 12th Graders: 2016 MTF Data (Miech et al., 2017)



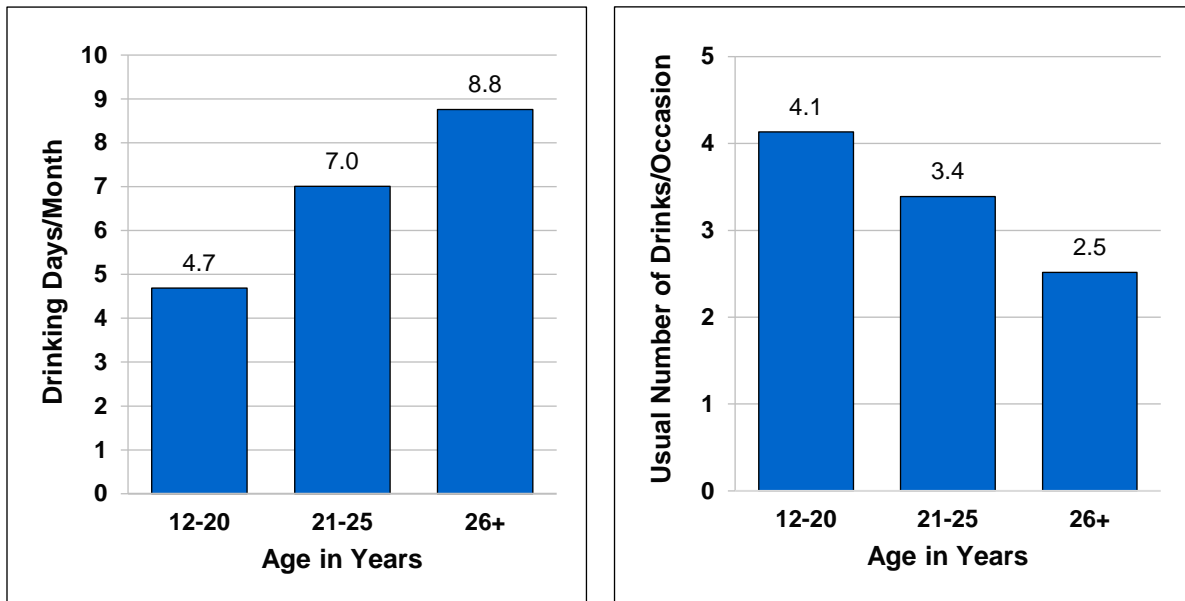
More information about patterns of alcohol use among emerging adults (ages 18 to 24), including binge drinking, alcohol-impaired driving, and alcohol-related deaths and overdose hospitalizations, is provided in a recent article. Hingson, Zha, and Smyth (2017) reported that, among 18- to 20-year-olds in college, binge drinking in the past month declined from 39 percent in 1999 to 30 percent in 2014. Among non-college respondents, it remained steady at 32

percent. Driving under the influence among 18- to 20-year-olds in college declined from 25 percent to 18 percent and from 17 percent to 9 percent among those not in college. The publication reported trends in alcohol-related injury deaths among 18- to 24-year-olds as a group. Those rose from 4,827 in 1998 to 5,512 in 2005, then steadily declined to 4,139 in 2014, a 29 percent decline per 100,000 persons. Specifically, among 18- to 20-year-olds, alcohol-related injury deaths steadily declined from 2,033 in 1998 to 1,338 in 2014, a 34 percent decline per 100,000 persons. Alcohol-related traffic deaths declined from 1,588 in 1998 to 867 in 2014, a 45 percent decline per 100,000 persons. Alcohol poisoning deaths among 18- to 20-year-olds rose from 77 in 1998 to 215 in 2014, a 153 percent increase per 100,000 persons. All other types of alcohol-related non-traffic injury deaths declined among 18- to 20-year-olds from 1998 to 2014 (Hingson et al., 2017).

Youth Binge More and Drink More Than Adults When They Drink

Young drinkers tend to drink less often than adults; however, when they do drink, they drink more intensely. Underage drinkers consume, on average, about four drinks per occasion, about five times a month, whereas adult drinkers 26 and older average two and one half drinks per occasion, about nine times a month (CBHSQ, 2017c; Exhibit 2.11).

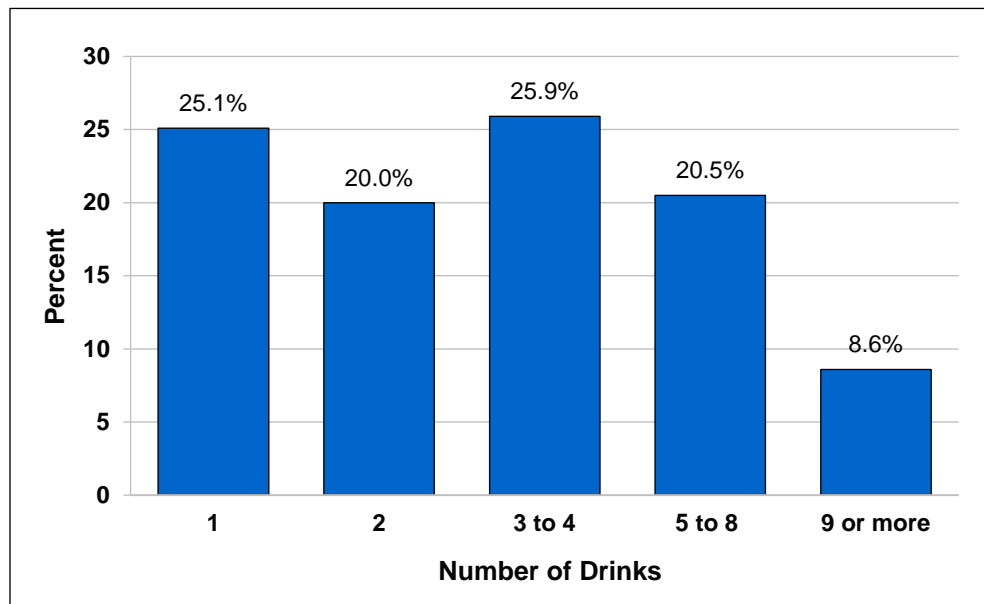
Exhibit 2.11: Number of Drinking Days per Month and Usual Number of Drinks per Occasion for Youth (12–20), Young Adults (21–25), and Adults (≥26): 2016 NSDUH Data (CBHSQ, 2017c)



Youths ages 12 to 15 can, according to a theoretical analysis, reach the same blood alcohol concentration (BAC) after consuming three to four drinks within 2 hours as adults ages 18 and older who consume four to five drinks during this same time period (Donovan, 2009). This suggests that binge and heavy drinking may be even riskier for younger adolescents than for older youth and may occur with greater frequency than is reflected in survey data.

Youths were asked about the number of drinks consumed on their last occasion of alcohol use in the past month as part of the NSDUH survey. Combining the results from the 2015 and 2016 surveys, the majority of underage drinkers report consuming three or more drinks on a single occasion. Nearly 30 percent of underage youth consume five or more drinks, and almost nine percent consume nine or more drinks (Exhibit 2.12; CBHSQ, 2017c)

Exhibit 2.12. Number of Drinks Consumed on a Single Occasion by Underage Youth: 2015, 2016 Combined Data NSDUH (CBHSQ, 2017c)



Particularly worrisome is the high prevalence of binge drinking among underage drinkers, which MTF defines as five or more drinks in a row in the past 2 weeks. In 2016, 3.4 percent of 8th graders, 9.7 percent of 10th graders, and 15.5 percent of 12th graders reported binge drinking (Miech et al., 2017). According to NSDUH data, approximately 4.5 million youths ages 12 to 20 (12.1 percent) engaged in binge alcohol use (defined as four drinks or more on at least 1 day in the past 30 days).

A subset of this group (about 1.1 million or 2.8 percent) exhibited heavy alcohol use, defined as binge drinking 5 or more days a month. In 2016, approximately 3.0 percent of males ages 12 to 20 reported heavy drinking, and 2.6 percent of females (CBHSQ, 2017a).

Faden and Fay (2004) used statistical trend analyses to examine underage drinking data from 1975 to 2002. Among 12th graders, drinking five or more drinks in a row in the past 2 weeks declined 7.6 percent, from 36.8 percent in 1975 to 29.2 percent in 2002. Analysis of the intervening years showed that the prevalence of drinking five or more drinks in a row in the past 2 weeks rose from 1975 to 1980, fell from 1980 to 1987, steeply declined from 1987 to 1993, rose from 1993 to 1997, and declined from 1997 to 2002 (Faden & Fay, 2004). Subsequent statistical trend analyses showed that for 12th graders, the prevalence of drinking five or more drinks in a row in the past 2 weeks continued to fall between 2002 and 2015 and from 2005 to 2015 (Chen et al., 2017).

From 2002 to 2012, there were statistically significant declines in binge drinking for all three grades assessed by the MTF. For 8th, 10th, and 12th graders, 2016 marked the lowest levels for alcohol use and drunkenness ever recorded by the MTF survey (Johnston et al., 2017b).

A troubling subset of binge drinking is “extreme” binge drinking or high-intensity binge drinking, often defined as consumption of 10 or 15 or more drinks on one or more occasions in the previous 2 week period (Miech et al., 2017). MTF has tracked the prevalence of consuming 10 or more and 15 or more drinks in a row since 2005. According to MTF data for 2016, 4.4 percent of 12th graders reported consuming 10 or more drinks in a row, and 2.3 percent reported consuming 15 or more drinks in a row within the previous 2 weeks.

Since 2005, there has been a decline of 6.2 percent for 10 or more drinks in a row and a decline of 3.4 percent for 15 or more drinks in a row, compared with a decline of 11.6 percent for all binge drinking. Rates for 2016 for extreme binge drinking are at the lowest levels recorded by the MTF to date (Miech et al., 2017). However, an in-depth analysis of high-intensity binge drinking (15+ drinks) suggests it may be more entrenched in some adolescent subcultures than lower-intensity binge drinking (5+ drinks; Patrick et al., 2013).²¹ In addition, analysis of high school seniors in the MTF study indicates that the heaviest drinkers and marijuana users are more likely to use both substances simultaneously (Patrick, Veliz, & Terry-McElrath, 2017).

YRBS data from 2015 indicated that 4.3 percent of high schoolers (grades 9 through 12) reported drinking 10 or more drinks within 2 hours at least once in the last month. The percentage for males was 6.1 percent and for females, 2.5 percent (Kann et al., 2016).

Teen Binge Drinking Is Not Limited to the United States

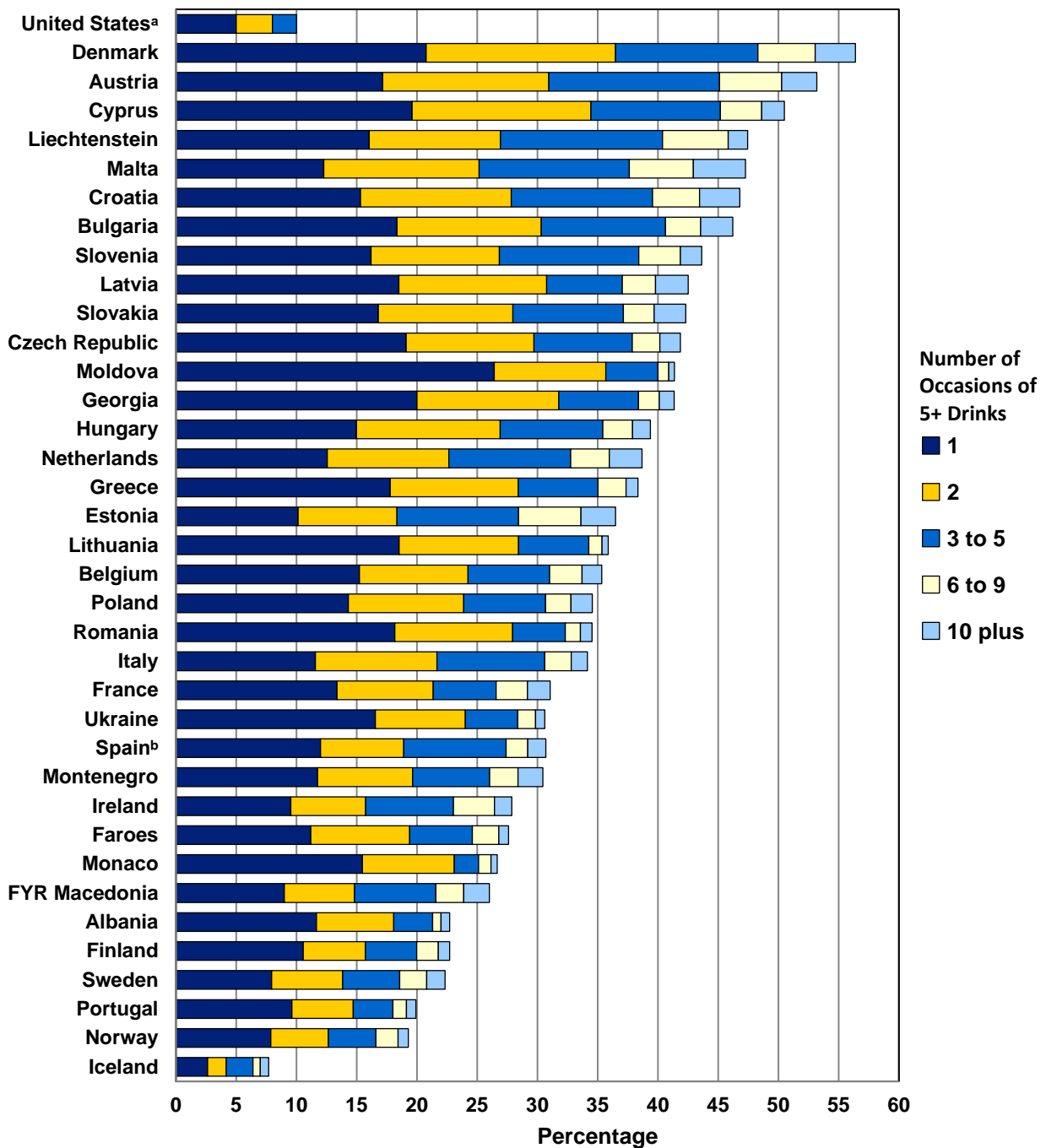
The most recently available data (from 2015), indicate that in many European countries, a significant proportion of young people ages 15 to 16 report binge drinking at rates higher than in the United States (Exhibit 2.13; Kraus et al., 2016). In all countries listed in Exhibit 2.13, the MLDA is lower than in the United States. These data call into question the suggestion that having a lower MLDA results in less problem drinking by adolescents.

Individual, Family, and Contextual Differences in Underage Drinkers

Adolescent alcohol consumption is a complex behavior influenced by multiple factors, including the normal maturational changes that all adolescents experience; the various social and cultural contexts in which adolescents live (e.g., family, peers, school); genetic, psychological, and social factors specific to each adolescent; and environmental factors that influence availability and appeal of alcohol (e.g., enforcement of underage alcohol policies, marketing practices, media exposure).

²¹It should be noted that data estimates for 10+ and 15+ drinks for 12th graders are subject to a larger sampling error due to the limited number of cases in a single questionnaire form; data estimates on 5+ drinks are more stable.

Exhibit 2.13: Percentage of European Students Ages 15–16 Who Reported Drinking 5+ Drinks on a Single Occasion in the Past 30 Days Compared with American 10th Graders: Data from 2015 European School Survey Project on Alcohol and Drugs (Kraus et al., 2016)



Notes: “Think back again over the LAST 30 DAYS. How many times (if any) have you had five or more drinks on one occasion? (A ‘drink’ is [INSERT NATIONALLY RELEVANT EXAMPLES].” *Information on ESPAD data collection is available at www.espad.org*

^a – U.S. data is from MTF

^b – Number of days, not occasions

Biological factors (such as genes and hormones) and environmental factors (such as family, peers, school, and the overall culture) interact and influence the extent to which the adolescent will use alcohol. Internal and external factors influence in reciprocal ways as the adolescent's development unfolds over time. Youths are not all at risk in the same way or to the same degree. The next sections address some of the individual, family, and contextual differences correlated with alcohol consumption.

Genetics

Children whose families include individuals who misuse alcohol are at increased risk for alcohol dependence throughout their lives. Genes account for more than half the risk for alcohol dependence; environmental factors account for the rest. However, no single gene accounts for the majority of risk. Development of a complex behavioral disorder, such as alcohol dependence, likely depends on specific genetic factors interacting with one another, multiple environmental factors, and the interaction between genetic and environmental factors. Research suggests that genes have a stronger influence on the development of problematic use, whereas environment seems to play a greater role in initiation of use (Rhee et al., 2003).²² The current college environment may increase the likelihood that people with genetic predispositions to alcohol use disorders will have those predispositions expressed (Timberlake et al., 2007).

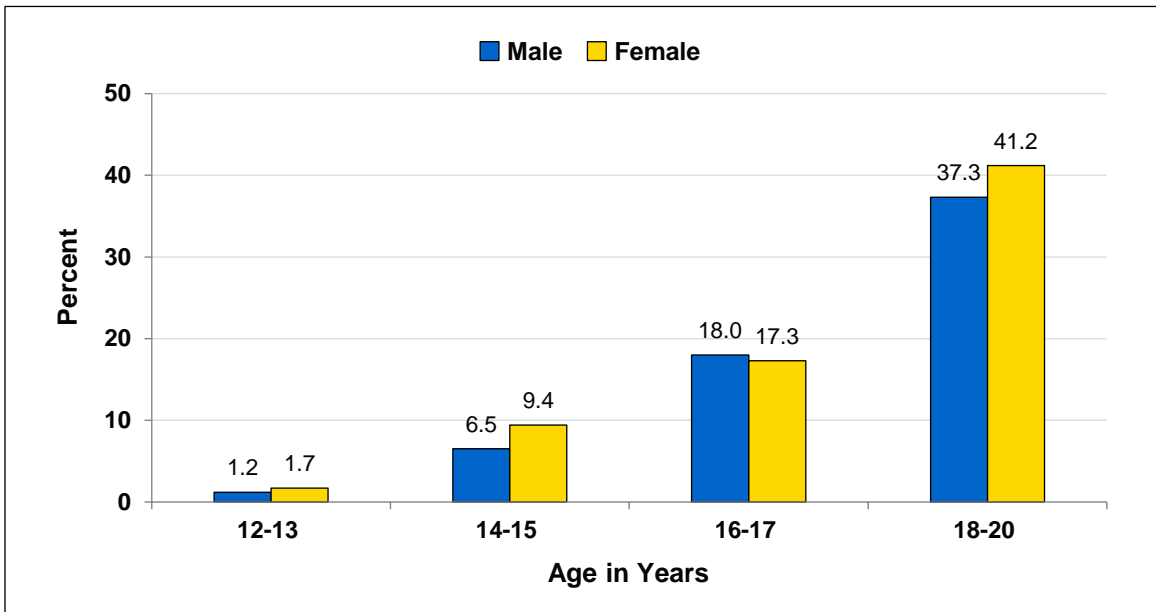
Gender

Although underage males and females tend to start drinking at about the same age and have approximately the same prevalence of any past-month alcohol use, males are more likely to drink with greater frequency and to engage in binge and heavy drinking. According to the 2016 NSDUH data, among underage drinkers, the overall prevalence of past-month alcohol use by females has now exceeded use by males: 18.6 percent of males ages 12 to 20 were current drinkers compared with 20.1 percent of females in that age group (CBHSQ, 2017a). The prevalence was higher for females than males for ages 14 to 15 and 18 to 20; it was similar between girls and boys for ages 12 to 13 and 16 to 17 (Exhibit 2.14).

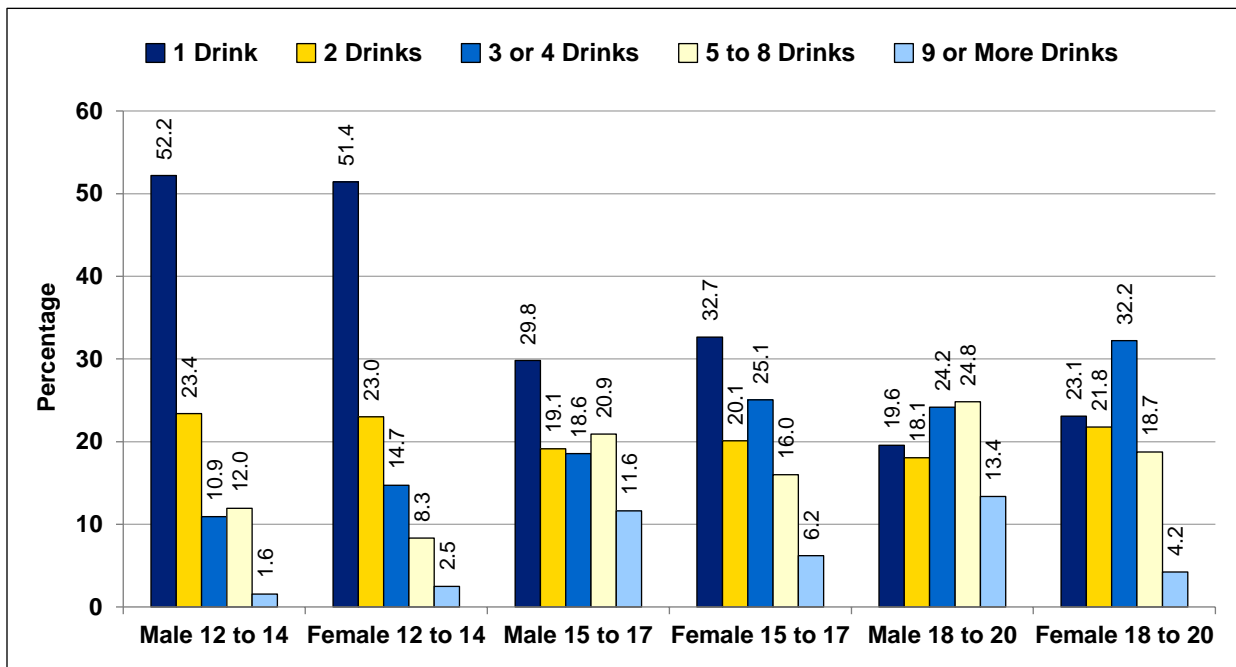
According to 2016 NSDUH data (Exhibit 2.15), the number of drinks consumed on last occasion of alcohol use differs by gender: underage females are more likely to report consuming one to four drinks, and underage males five to nine drinks or more. Among past-month alcohol users ages 12 to 20, the number of drinks reported on the last occasion tends to increase with age (CBHSQ, 2017c).

²²“Problematic use” was defined as having at least one DSM-IV abuse or dependence symptom for alcohol.

**Exhibit 2.14. Past Month Alcohol Use by Age and Gender:
2016 NSDUH Data (CBHSQ, 2017c)**



**Exhibit 2.15: Number of Drinks Consumed on Last Occasion of Alcohol Use
in the Past Month Among Past-Month Alcohol Users Ages 12–20,
by Gender and Age Group: 2015, 2016 Combined Data NSDUH (CBHSQ, 2017c)**



In the 2016 MTF data, females were more likely to report drinking in the lower grades, with 8th grades females at 7.8 percent and males at 6.7 percent; 10th grade females at 20.9 percent and males at 18.6 percent. In the 12th grade, a higher percentage of males (34.5 percent) than females (32 percent) reported drinking.

MTF trend data demonstrate that since 1991, rates of binge drinking have generally been *decreasing* across all grade groups, including college age respondents (ages 19 to 22), with rates for males decreasing faster than for females. The gap between male and female bingeing rates has been steadily closing since 1991 (Exhibit 2.16; Miech et al., 2017). For example, in 1991, among 12th graders, there was a 16.6 percentage point spread between the rates of males and females; in 2016, it was 3.7 points.

Any discussion of gender differences in underage drinking should include consideration of the biological factors that may underlie or contribute to differences in drinking behavior and their consequences. Differences in body composition (e.g., increased body fat, decreased muscle mass, and subsequently less body water, in females) result in a greater BAC in females compared with males consuming the same amount of alcohol. These physiological differences suggest that females will experience alcohol-related problems at lower doses of alcohol. On the other hand, males tend to have lower reactivity (perceived effects of alcohol as a function of amount consumed), putting them at greater risk for binge and heavy drinking (Schulte, Ramo, & Brown, 2009).

Race and Ethnicity

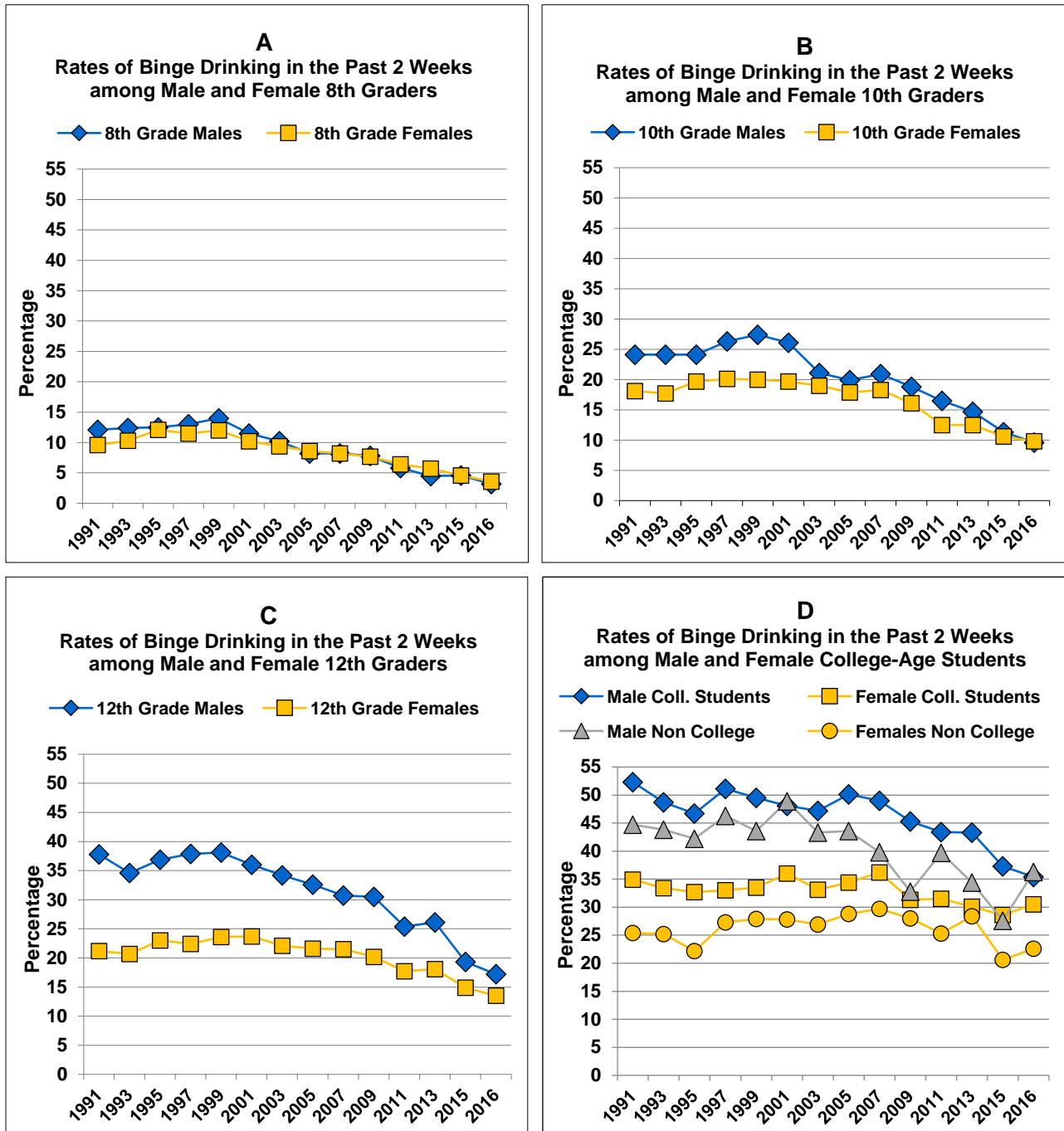
According to 2002–2016 NSDUH data,²³ Whites ages 12 to 20 were more likely to report current alcohol use than any other race or ethnic group. The detailed prevalence of past-month alcohol use by gender and race/ethnicity was White males (29.9 percent), White females (28.9 percent), American Indian or Alaska Native females (24.9 percent), Native Hawaiian or Other Pacific Islander females (24.8 percent), Native Hawaiian or Other Pacific Islander males (24.6 percent), Hispanic or Latino males (24.0 percent), females of multiple races (23.8 percent), males of multiple races (22.8 percent), Hispanic or Latina females (21.7 percent), American Indian or Alaska Native males (21.6 percent), Black or African American males (18.5 percent), Black or African American females (17.8 percent), Asian males (16.4 percent), and Asian females (15.2 percent).

NSDUH data (2015–2016) on binge alcohol use for males and females²⁴ ages 12 to 20 indicate that an estimated 15.2 percent of White females and 15.0 percent of White males reported having five or more drinks on the same occasion on at least 1 day within the past 30 days. The remaining race/ethnicity and gender group rates in descending order include females of multiple races (14.3 percent), Hispanic females (11.6 percent), Hispanic males (11.5 percent), American Indian or Alaska Native females (11.5 percent), males of multiple races (10.5 percent), Black females (8.5 percent), Asian males (8.2 percent), Asian females (7.9 percent), Native Hawaiian or Other Pacific Islander males (7.9 percent), American Indian or Alaska Native males (7.0 percent), and Black males (7.0 percent; Exhibit 2.17; CBHSQ, 2017c).

²³To provide sample sizes sufficient to produce reliable estimates for each race/ethnic group, multiyear estimates of past-month alcohol use and binge drinking by race/ethnicity were calculated.

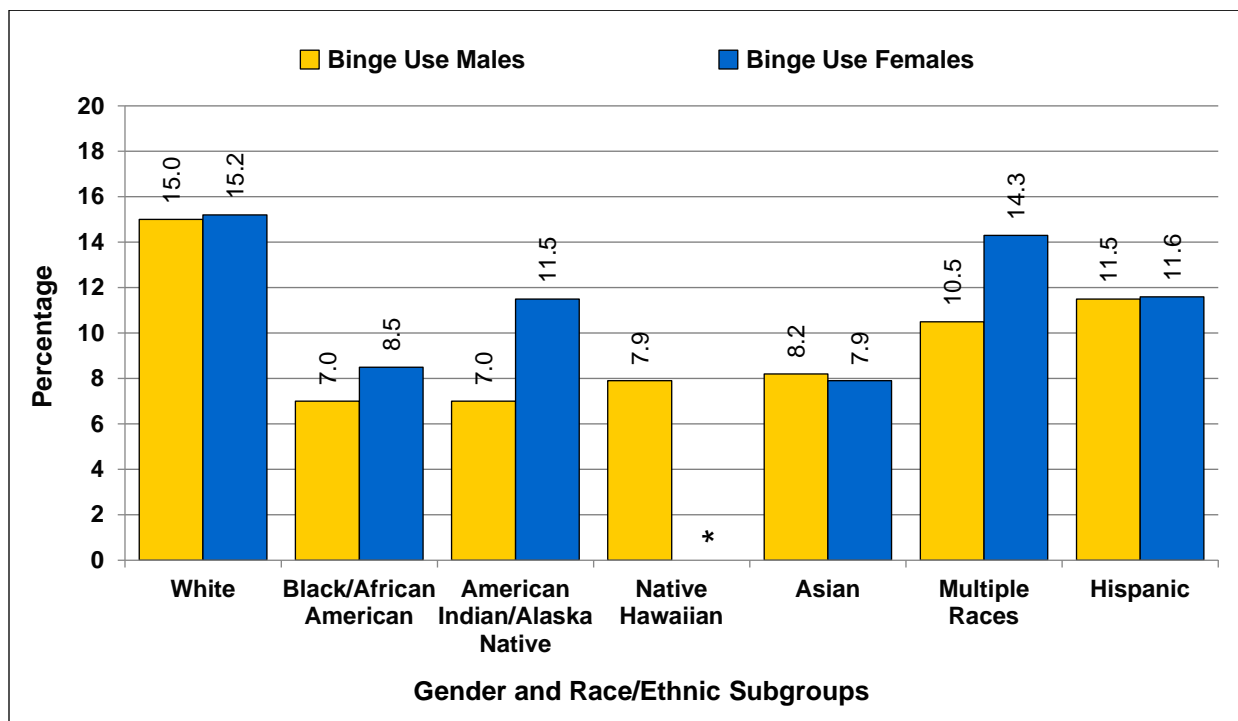
²⁴Data for Native Hawaiian or other Pacific Islander females are suppressed due to low numbers.

Exhibit 2.16: Rates of Binge Drinking in the Past 2 Weeks Among Male and Female 8th, 10th, and 12th Graders and College/College-Age Students:²⁵ 1991–2016 MTF Data
 (Johnston, O’Malley, Miech, Bachman, & Schulenberg, 2017a; Miech et al., 2017)



²⁵MTF Volume 2 defines college students as follow-up respondents (i.e., high school graduates) 1 to 4 years past high school who report that they were taking courses as full-time students in a 2- or 4-year undergraduate college at the beginning of March in the year in question. Non-college students are those 1 to 4 years past high school, not enrolled in college. Note that some of these respondents may be age 21 or over.

**Exhibit 2.17: Binge Drinking in the Past Month
Among People Ages 12–20 by Race/Ethnicity and Gender,
Annual Averages: 2015–2016 Combined Data NSDUH (CBHSQ, 2017c)**



Ethnic and racial differences must be viewed with some caution. As Caetano, Clark, and Tam (1998) noted, there are important differences in alcohol use and related problems among ethnic and racial subgroups of Blacks, Hispanics, Asians, and Native Americans/Alaska Natives. Moreover, the patterns of consumption for any group or subgroup represent a complex interaction of psychological, historical, cultural, and social factors inadequately captured by a limited set of labels. A recent study examined the effectiveness of prevention strategies in communities of racial minorities, specifically for youth in the Cherokee Nation in Oklahoma (Komro, et al., 2017). The study was one of the largest alcohol prevention trials ever conducted with an American Indian population, and the first to demonstrate the effectiveness of screening and brief counseling intervention in significantly reducing youth alcohol use at a community level. More such research could help to identify successful interventions for preventing alcohol use among racial and ethnic minorities.

Parental Attitudes and Behaviors

Parental monitoring and parental attitudes and perceptions about drinking (such as seeing underage drinking as a rite of passage) have been shown to be very important influences on underage drinking. Studies have found that some parenting practices have proven beneficial in reducing adolescent alcohol use (Beck, Boyle, & Boekeloo, 2003; Ennett, Bauman, Foshee, Pemberton, & Hicks, 2001; Resnick et al., 1997; Watkins, Howard-Barr, Moore, & Werch, 2006). Parental monitoring, communication, and emotional support have a positive effect on adolescent alcohol use and are predictive of reduced adolescent alcohol problems (Ennett et al., 2001; Wood, Read, Mitchell, & Brand, 2004). At least one study suggests that parental

disapproval of any alcohol use during high school is correlated with reduced alcohol use in college (Abar, Abar, & Turrisi, 2009).

Some parents believe that providing alcohol to their children at home under supervision will lead to more moderate drinking practices. However, a meta-analysis of 22 studies found that parental provision of alcohol was associated with increased adolescent alcohol use, heavy episodic drinking, and higher rates of alcohol problems (Kaynak, Winters, Cacciola, Kirby, & Arria, 2014). The data were equivocal that parental provision is protective in the face of other risks.

Youth drinking is correlated with adult drinking behaviors.

Combined Factors

Generational transmission has been widely hypothesized as one factor shaping the alcohol consumption patterns of young people. Whether through genetics, social learning, or cultural values and community norms, researchers have repeatedly found a correlation between youth drinking behaviors and those of their adult relatives and other community adults at the household and community levels.

Nelson, Naimi, Brewer, & Nelson (2009) demonstrated this relationship at the population level as well, using YRBS state-based estimates. State estimates of youth and adult current drinking and binge drinking from 1993 through 2005 were significantly correlated when pooled across years. Analyzing YRBS data from 1999 to 2009, Xuan and colleagues (2013) found a positive correlation between state-level adult binge drinking and youth binge drinking. A 5 percent increase in binge-drinking prevalence among adults was associated with a 12 percent relative increase in the odds of alcohol use among youth.

Paschall, Lipperman-Kreda, & Grube (2014) examined relationships between characteristics of the local alcohol environment and adolescent alcohol use and beliefs in 50 California cities. A greater increase in past-year alcohol use and heavy drinking over a 3-year period was observed among adolescents living in cities with higher levels of adult drinking (measured at baseline), compared with adolescents not living in such cities.

Stronger state alcohol policies directed to the general population (e.g., alcohol taxes and regulations on alcohol outlet density) are independently associated with less youth drinking, and the effect of these policies on youth drinking is mediated, in part, through their effects on adults (Xuan et al., 2015). Similarly, a study found that while more than one-fourth of traffic crash deaths among young people are alcohol-related, stronger alcohol policy environments are associated with lower mortality rates from alcohol-related motor vehicle crashes (Hadland et al., 2017).

Other Substance Use

While underage youth use a wide variety of substances, marijuana is the illicit substance²⁶ most often consumed by youths. This has been true since the very first MTF assessments (Johnston et al., 2017b). Twenty-five percent of 12th-grade males and 19.7 percent of 12th-grade females

²⁶Marijuana is classified as an illicit drug at the federal level, although a number of states have legalized consumption for adults.

report use of marijuana in the past 30 days in the MTF survey. An analysis of multi-substance use patterns among youth ages 12 to 17 in NSDUH data (2002 to 2014) revealed that 16.1 percent used multiple substances, and that the use of more than one substance is associated with an increased likelihood of a substance use disorder. Use of multiple substances has also been linked to heavier consumption patterns in adulthood compared with single or dual substance use (Han, Compton, Blanco, & DuPont, 2017).

NSDUH data indicate that for underage drinkers ages 12 to 17, higher levels of alcohol use are associated with higher levels of marijuana use. Reports of marijuana use among heavy drinkers is 60.4 percent; 48 percent among binge drinkers; and 24.4 percent of occasional alcohol users. Only 3.3 percent of those who do not consume alcohol reported marijuana use (CBHSQ, 2017a).

The simultaneous use of substances while driving has significant public safety implications; impairment increases as the number of substances increases. An analysis of NSDUH data related to driving under the influence noted that 4.7 percent of males and 3.2 percent of females ages 16 to 20 reported driving under the simultaneous influence of alcohol and illicit drugs in 2014. Although the trend in impaired driving has decreased since 2002, it remains a concern (Lipari, Hughes, & Bose, 2016). Another concern is the potential combined effect of alcohol with opioids. A recent study found that respiratory depression caused by opioids, which can be fatal, is exacerbated by the effects of alcohol in young adults (Schrier et al., 2017).

Number of People Present at a Drinking Event

Underage alcohol use is strongly affected by the context in which drinking occurs. Of particular concern is underage drinking at large parties. Most (75.2 percent) people ages 12 to 20 who had consumed alcohol in the past month were with two or more people the last time they drank, 17.9 percent were with one other person the last time they drank, and 6.9 percent were alone (CBHSQ, 2017c).

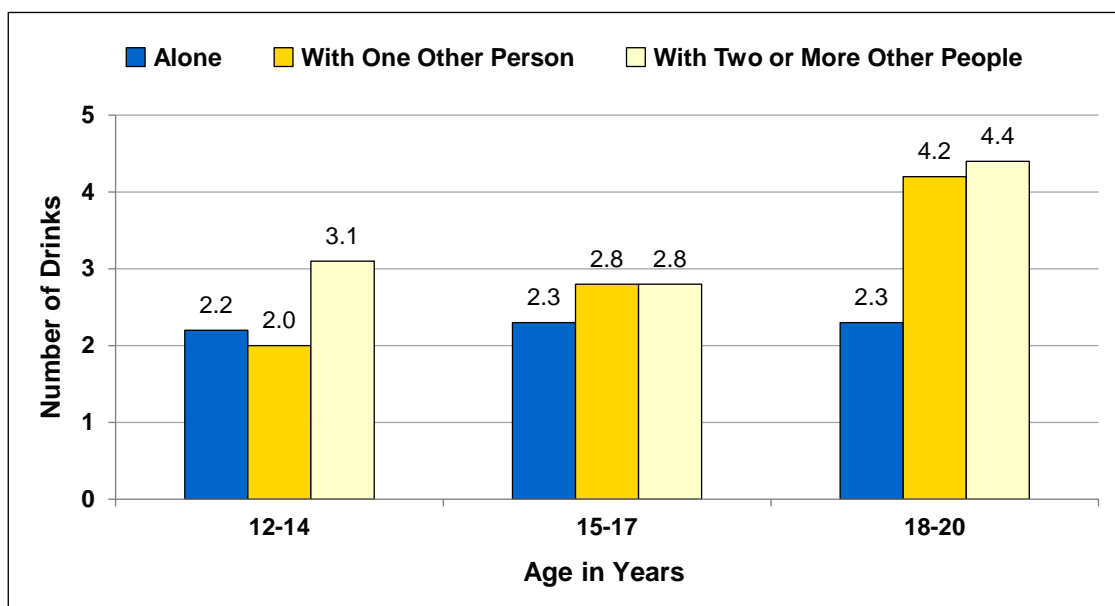
Most male and female underage drinkers were with two or more other people on their last drinking occasion (75.1 percent and 75.4 percent, respectively). However, male drinkers were more likely to drink alone (8.7 percent) than were female drinkers (5.1 percent).

Underage people who drank with two or more other people on the last occasion in the past month had more drinks on the last occasion on average (4.3 drinks) than did those who drank with one other person (2.8 drinks) or drank alone (2.7 drinks; Pemberton, Colliver, Robbins, & Gforerer, 2008; CBHSQ, 2017c).

Males consumed more drinks than did females for two of the three situations (drinking with one other person or drinking with two or more people). For example, when the last drinking occasion was with two or more other people, males averaged 5.0 drinks, whereas females averaged 3.7 drinks (CBHSQ, 2017c).²⁷ Number of drinks consumed by social context also varies by age group, as shown in Exhibit 2.18.

²⁷The discussion in this section combines data for 2015 and 2016.

Exhibit 2.18: Average Number of Drinks Consumed on Last Occasion of Alcohol Use in the Past Month Among Past-Month Alcohol Users Ages 12–20, by Social Context and Age Group: Annual Averages Based on 2015-2016 NSDUH Data (CBHSQ, 2017c)



Location of Alcohol Use

Most underage drinkers reported last using alcohol in someone else’s home (49.2 percent, averaging 4.4 drinks) or in their own home (35.9 percent, averaging 3.3 drinks).²⁸ The next most popular drinking locations were at a restaurant, bar, or club (8.0 percent, averaging 4.4 drinks); at a park, on a beach, or in a parking lot (5.0 percent, averaging 4.8 drinks); or in a car or other vehicle (4.0 percent, averaging 4.8 drinks).

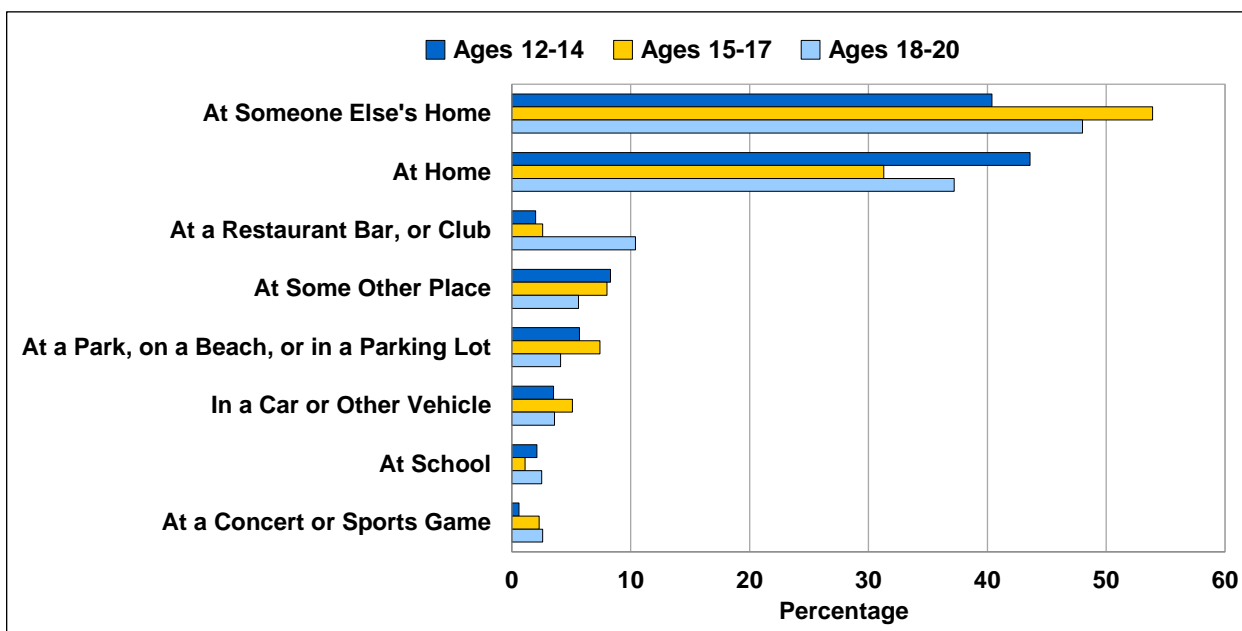
Current drinkers ages 12 to 20 who last drank at a concert or sports game (2.4 percent of all underage drinkers) consumed an average of 5.9 drinks (CBHSQ, 2016a). Thus, most young people drink in social contexts that appear to promote heavy consumption and where people other than the drinker may be harmed by the drinker’s behavior.

Drinking location varies by age. For example, drinkers ages 12 to 14 were more likely to have been in their own homes the last time they drank (43.6 percent) than were 15- to 17-year-olds (31.3 percent) or 18- to 20-year-olds (37.2 percent). By contrast, 12- to 14-year-olds were less likely to report being in someone else’s home the last time they drank (40.4 percent) than the 15- to 17-year-olds (53.9 percent).

Drinkers ages 18 to 20 were more likely than those in younger age groups to have been in a restaurant, bar, or club on their last drinking occasion (10.4 percent for those ages 18 to 20 versus 2.0 percent for those ages 12 to 14, and 2.6 percent for those ages 15 to 17; Exhibit 2.19). Female current alcohol users ages 12 to 20 were more likely than males to have had their last drink at a restaurant, bar, or club (10.0 percent versus 6.1 percent; CBHSQ, 2016a).

²⁸For the analyses in this section, 2015 and 2016 NSDUH data are combined to provide sufficient sample sizes.

Exhibit 2.19: Drinking Location of Last Alcohol Use Among Past-Month Alcohol Users Ages 12–20 by Age Group: Annual Averages Based on 2015–2016 NSDUH Data (CBHSQ, 2017c)



Underage Drinking Parties

Data cited above suggest that underage drinking occurs primarily in a social context (with three or more drinkers) at private residences. Such drinking occasions include parties at which large numbers of youth are present. Drinking parties attract those 21 and over as well as significant numbers of underage drinkers (Wells, Graham, Speechley, & Koval, 2005). For this reason, parties are a common environment in which young drinkers are introduced to heavy drinking by older and more experienced drinkers (Wagoner et al., 2012).

Parties are settings for binge drinking and other patterns of consumption leading to high BACs (Clapp, Min, Shillington, Reed, & Ketchie Croff, 2008; Clapp, Reed, Holmes, Lange, & Voas, 2006; Demers et al., 2002; Paschall & Saltz, 2007; Usdan, Moore, Schumacher, & Talbott, 2005; Wagoner et al., 2012). Factors that increase the risk of high BACs include the size of the party and the number of people drinking (Wagoner et al., 2012), drinking games (Clapp et al., 2006, 2008), “bring your own booze” policies (Clapp et al., 2006), parties sponsored by fraternities (Paschall & Saltz, 2007), and parties where illicit drugs are available (Clapp et al., 2006).

Demers and colleagues (2002) suggested that large parties have a greater facilitative effect on men’s drinking than on women’s. Drinking parties are also often settings for aggression, including serious arguments, pushing, fights, and sexual assault (Wagoner et al., 2012). Because large numbers of youth are drinking outside their own homes, drinking parties may significantly increase the risk of driving after drinking (Gonzales, Largo, Miller, Kanny, & Brewer, 2015).

Drinking parties pose serious problems for law enforcement officers. These include breaking up parties without allowing drinkers to flee to their cars (Pacific Institute for Research and

Evaluation [PIRE], 2000), processing large numbers of underage offenders (PIRE, 2000), and identifying the individuals who have furnished alcohol to minors (Wagoner et al., 2012).

Paschall, Lipperman-Kreda, Grube, & Thomas (2014) rated social host policies, which impose liability on adults who host underage drinking parties, for comprehensiveness and stringency. They found a small but significant negative relationship between the strength of the policies and underage drinking at parties among past-year drinkers. For information on party-related enforcement practices and relevant state legal policies, see the State Performance and Best Practices.

College Environment

In its landmark 2002 report, *A Call to Action: Changing the Culture of Drinking at U.S. Colleges* (NIAAA Call to Action), NIAAA noted the following:

The tradition of drinking has developed into a kind of culture—beliefs and customs—entrenched in every level of college students’ environments. Customs handed down through generations of college drinkers reinforce students’ expectation that alcohol is a necessary ingredient for social success. These beliefs and the expectations they engender exert a powerful influence over students’ behavior toward alcohol.²⁹

Campus drinking culture persists. Although college-bound 12th-graders are consistently less likely than non-college-bound counterparts to report heavy drinking, individuals in college³⁰ report higher rates of binge drinking than do same-age youth who are not attending college (Johnston et al., 2017a; Exhibit 2.20).

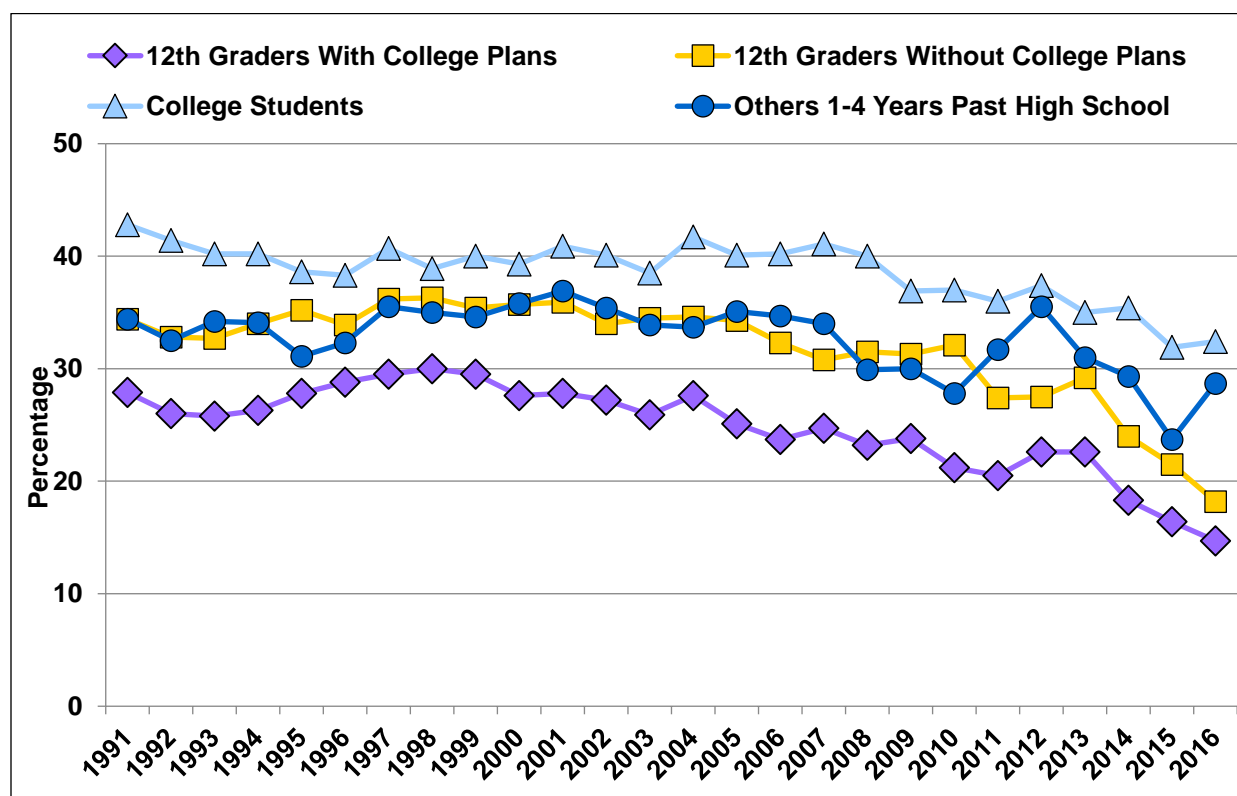
Colleges and universities vary widely in their student drinking and binge drinking rates; however, overall rates of college student drinking and binge drinking exceed those of same-age peers who do not attend college, although data show an increased rate of binge drinking in 2016 for those not in college. Of college students, 63.2 percent drink currently, compared with 59.2 percent of those of the same age and not in college; 40.8 percent report having been drunk in the past month, compared with 30.4 percent of their non-college peers (Schulenberg et al., 2017).

These findings suggest that college environments influence drinking behaviors (Hingson, Heeren, Levenson et al., 2002; Kuo, Wechsler, Greenberg, & Lee, 2003; LaBrie, Grant, & Hummer, 2011). However, as Carter and colleagues noted, college attendance is only one factor potentially influencing alcohol consumption during this period of emerging adulthood (Carter, Brandon, & Goldman, 2010).

²⁹For many students, alcohol use is not a tradition. Students who drink the least attend 2-year institutions, religious schools, commuter schools, and historically Black colleges and universities (Meilman, Leichliter, & Presley, 1999; Meilman, Presley, & Cashin, 1995; Meilman, Presley, & Lysterla, 1994).

³⁰College students are defined as those follow-up MTF respondents 1 to 4 years past high school who report that they were taking courses as full-time students in a 2- or 4-year undergraduate college at the beginning of March of the year in question. Non-college same-age peers are follow-up MTF respondents 1 to 4 years past high school who do not report taking courses. Both groups include a percentage of individuals who have reached the legal drinking age. Underage college students drink about 48 percent of the alcohol consumed by students at 4-year colleges (Wechsler, Lee, Nelson, & Kuo, 2002).

Exhibit 2.20: Prevalence of Binge Drinking in the Past 2 Weeks by 12th Graders With and Without College Plans, College Students, and Others 1 to 4 Years Past High School: 1991–2016 MTF Data (Johnston et al., 2017a)



Binge-drinking rates among college students have declined from 40.2 percent in 1993 to a current rate of 32.4 percent; however, drinking patterns remain a concern. Some college students far exceed the binge criterion of five drinks per occasion (Wechsler, Molnar, Davenport, & Baer, 1999; Wechsler & Nelson, 2008). According to 2012 through 2016 MTF data, 10.1 percent of college students (16.5 percent of males, 6.2 percent of females) reported consuming 10 or more drinks in a row in the past 2 weeks. In comparison, for non-college peers, 10.5 percent (17.6 percent of males and 4.7 percent of females) reported consumption of 10 or more drinks (Schulenberg et al., 2017).

Availability and Access to Alcohol

Ease of concealment, palatability, alcohol content, marketing strategies, media portrayals, parent modeling, and economic and physical availability may all contribute to the quantity of and settings for consumption. Beverage preferences may also affect the policies and enforcement strategies most effective in reducing underage drinking (Centers for Disease Control and Prevention [CDC], 2007).

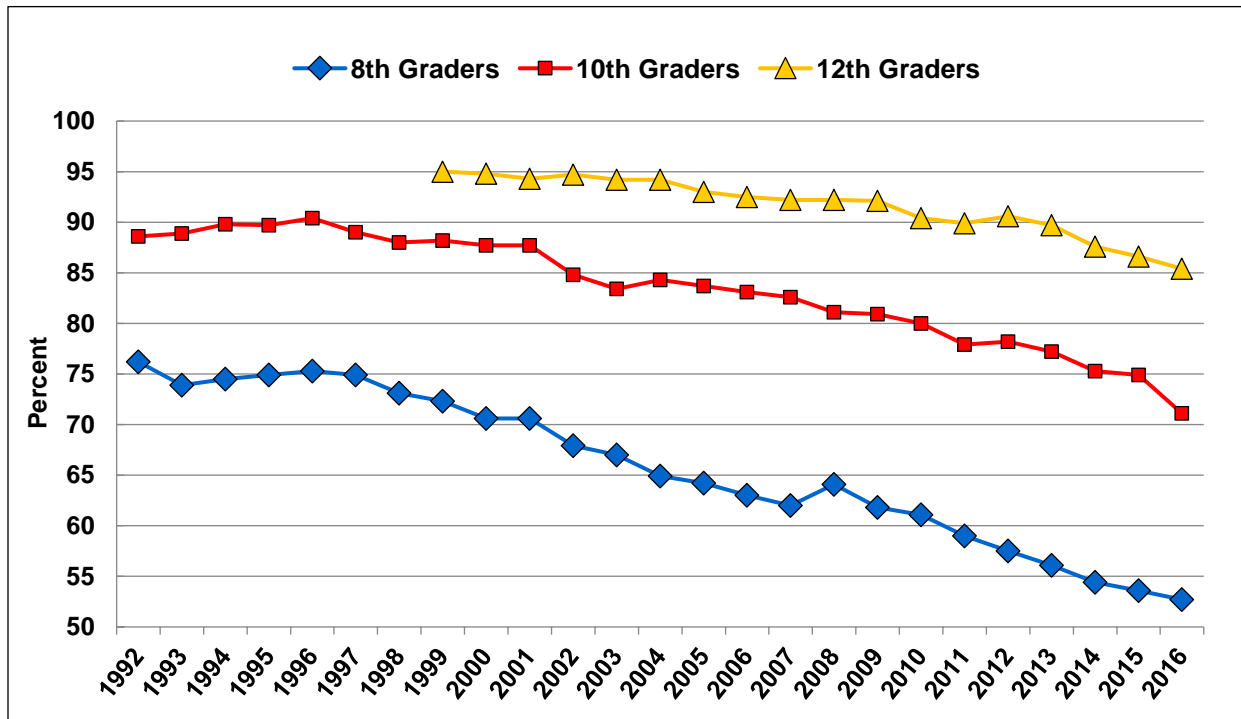
Alcohol is Perceived as Readily Available by the Underage Population

The relationship among alcohol availability, levels of consumption, and occurrence of alcohol-related problems is well documented in the *Surgeon General's (OSG's) Call to Action* (HHS, 2007). As shown in Exhibit 2.21, most teens see alcohol as readily available. In 2016, 52.7

percent of 8th graders, 71.1 percent of 10th graders, and 85.4 percent of 12th graders said alcohol would be “fairly easy” or “very easy” to get (Miech et al., 2017). Perceived availability, however, has declined (Exhibit 2.21).

These reductions in perceived availability may be attributable in part to the policies and enforcement practices described in the State Performance and Best Practices. Continued attention to these policies and practices may lead to further reductions.

Exhibit 2.21: Changes Over Time in Percentage of 8th, 10th, and 12th Graders Who Say Alcohol Is Fairly Easy or Very Easy to Get: 2016 MTF Data (Miech et al., 2017)



Alcohol Is Available From a Variety of Sources

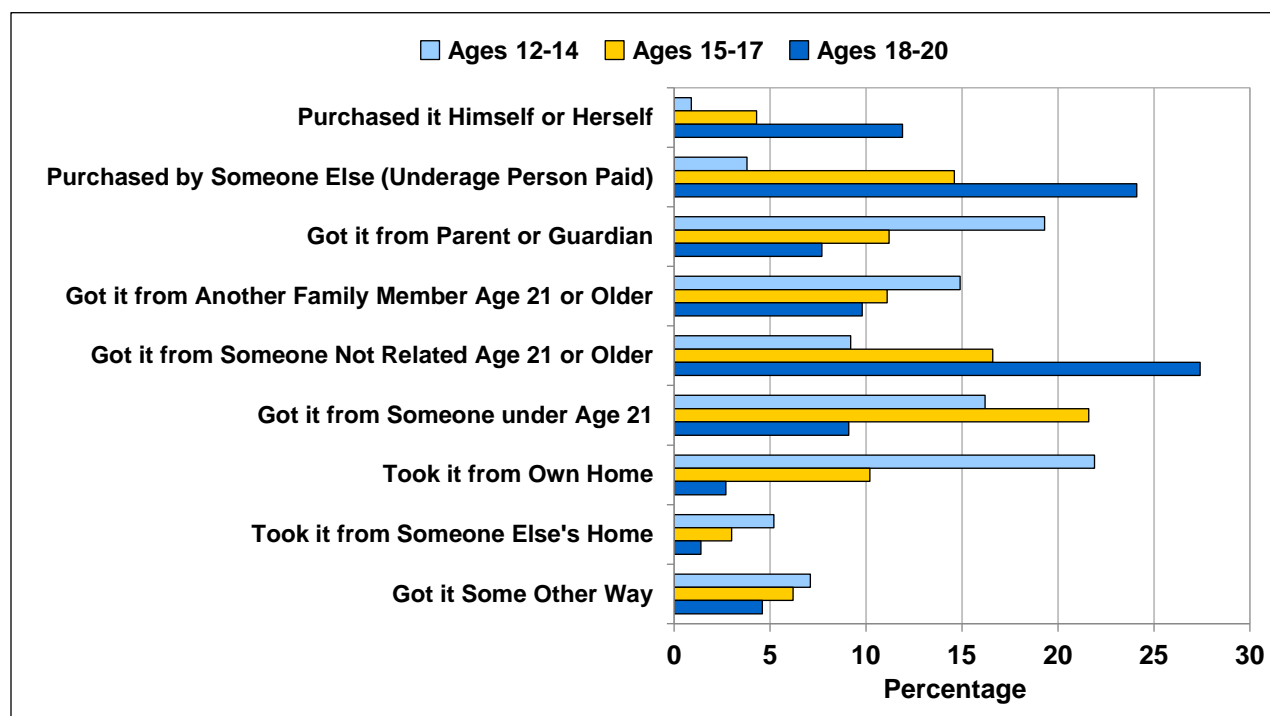
NSDUH divides sources of last alcohol use into two categories: the underage drinker paid (he or she purchased it or gave someone else money to do so) or did not pay (he or she received it for free from someone or took it from his or her own home or someone else’s home). Combined data from 2015 and 2016 show that among all underage current drinkers, 30.5 percent paid for alcohol the last time they drank, either purchasing the alcohol themselves or giving money to someone else to do so.

Those who paid for alcohol themselves consumed more drinks on their last drinking occasion (average of 5.1 drinks) than those who did not (average of 3.4 drinks). This difference is at least partially explained by the fact that older underage drinkers are more likely to pay for alcohol and to drink more (CBHSQ, 2016).

Among all underage drinkers, 69.5 percent did not pay for the alcohol the last time they drank. A total of 23.9 percent were given alcohol for free by an unrelated person age 21 or older, 9.1 percent got the alcohol from a parent or guardian, 10.3 percent got it from another family member age 21 or older, and 5.4 percent took it from their own homes (CBHSQ, 2017c).

The most common sources of alcohol varied substantially by age as shown in Exhibit 2.22. For youths ages 12 to 14, the most common sources were receiving it free from another family member age 21 or older (14.9 percent), or from a parent or guardian (19.3 percent), or taking it from their own home (21.9 percent). For youths ages 15 to 17, the most common sources were receiving it free from someone under age 21 (21.6 percent) or from an unrelated person age 21 or older (16.6 percent) or giving somebody else money to purchase the alcohol (14.6 percent; CBHSQ, 2017c).

Exhibit 2.22: Source of Last Alcohol Used Among Past-Month Alcohol Users Ages 12–20, by Age Group: 2015–2016 Combined Data NSDUH (CBHSQ, 2017c)



Among 18- to 20-year-olds, most current drinkers either received alcohol for free from an unrelated person age 21 or older (27.4 percent) or gave someone else money to purchase the alcohol (24.1 percent). Older underage people were more likely to have paid for alcohol themselves (either purchasing it themselves or paying someone else to purchase it) on their last drinking occasion: 36.2 percent of 18- to 20-year-olds did so, compared with 19.1 percent of 15- to 17-year-olds and 5.5 percent of 12- to 14-year-olds. Male underage drinkers were more likely to have paid for alcohol themselves on their last drinking occasion (35.8 percent) than their female counterparts (25.2 percent; CBHSQ, 2017c).³¹

Enforcement of furnishing laws is one key to reducing youth access to alcohol. A 2013 multi-community study found significant associations between the level of underage drinking law enforcement in the intervention communities and reductions in both 30-day use of alcohol and binge drinking (Flewelling et al., 2013).

³¹More detailed information can be found in the special report by Pemberton, Colliver, Robbins, and Gforerer (2008).

Alcohol Use by Beverage Type

Different alcohol beverage types are likely associated with different patterns of underage consumption. Tracking young people's beverage preferences is thus an important aspect of prevention policy. Since 1988, MTF data indicate beverage choices have shifted markedly for both male and female 12th graders (Exhibit 2.23). In 1988, beer was the beverage of choice for both sexes by a large margin. However, by 2011, for males, consumption of beer had declined and consumption of distilled spirits had increased, such that the two were equally reported that year. In subsequent years, choice of beer slightly exceeded choice of spirits. For females, a similar change occurred earlier (in 2005); females continue to choose distilled spirits over beer by a slight margin.

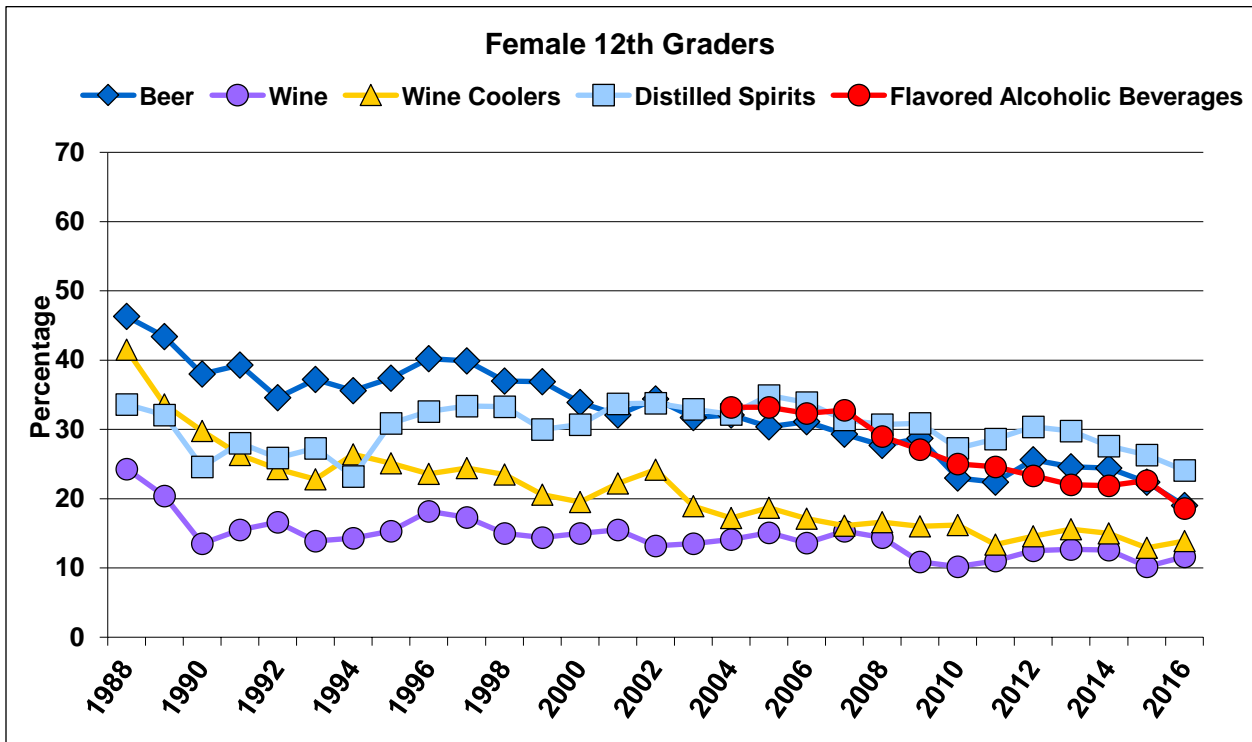
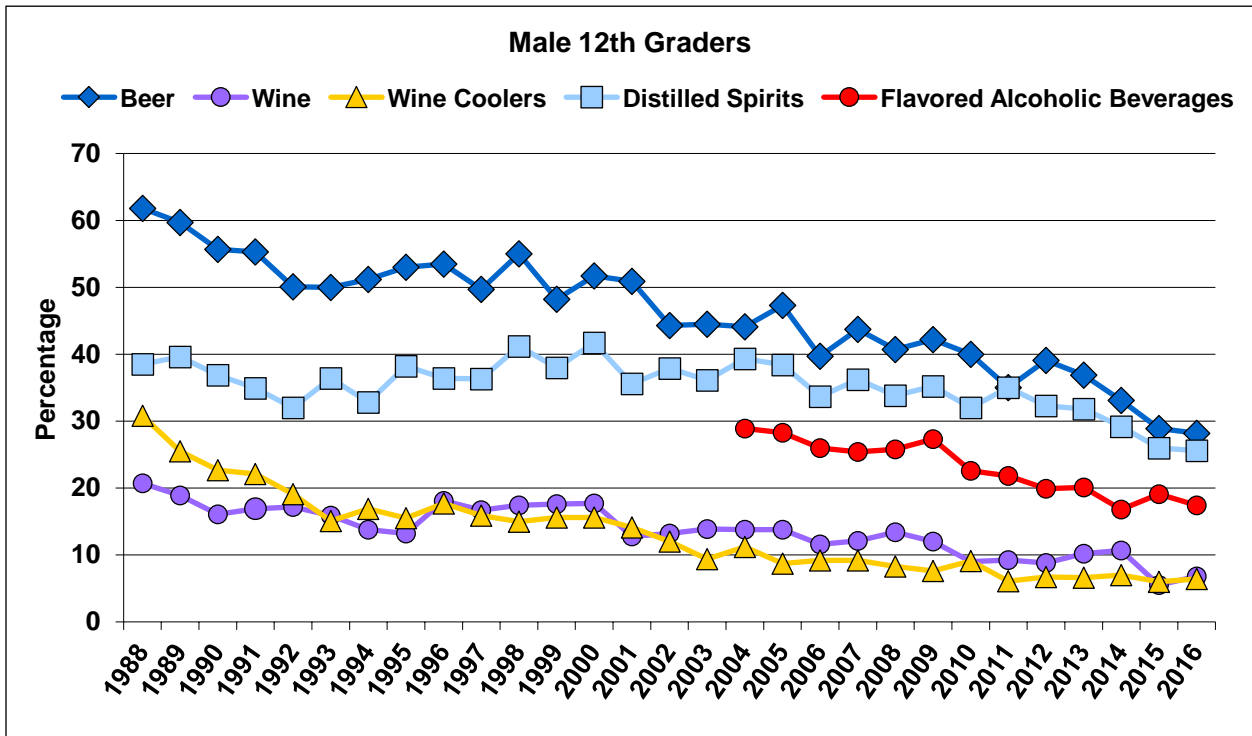
In 2004 (the first year that flavored alcoholic beverages were included in the survey), female choice of beer, distilled spirits, and flavored alcoholic beverages was about the same. Female consumption of flavored alcoholic beverages has declined steadily since then. Male consumption of flavored alcoholic beverages, which has not been as high as female consumption, also declined during this period.

Data from eight states (a subset of YRBS data) indicate that, among students in 9th to 12th grades who reported binge drinking, distilled spirits were the most prevalent beverage type (Siegel, Naimi, Cremeens, & Nelson, 2011). In a study of a nationally representative sample of youth ages 13 to 20 who had consumed at least one alcoholic drink in the past 30 days, distilled spirits accounted for 43.8 percent of binge-drinking prevalence, the highest percentage for any beverage type (Naimi, Siegel, DeJong, O'Doherty, & Jernigan, 2015).

Several studies (Albers et al., 2015; Fortunato et al., 2014; Naimi et al., 2015; Siegel et al., 2013) focused on underage drinkers' brand preferences, consistently finding that underage drinkers prefer a limited number of brands. Naimi and colleagues (2015), using a nationally representative Internet panel, found that the 25 brands consumed most frequently during binge drinking account for 46.2 percent of all binge drinking reports. Siegel and colleagues (2013) found that the top 25 brands account for about half of all alcohol consumption by volume.

Although high-potency grain alcohol products have a reported market share among youth of 0.7 percent, their retail availability is of considerable concern (Siegel et al., 2013). These products are cheap, and given that they are twice as strong (151 to 190 proof) as standard spirits products (80 to 101 proof), underage consumers may find it very difficult to gauge their alcohol consumption, increasing the likelihood of injury. Epidemiologic data on the use of high-potency

Exhibit 2.23: Trends in the Percentage of Male and Female 12th Graders Using Specific Types of Alcoholic Beverages in the Past 30 Days: 1988–2016 MTF Data (Johnston et al., 2017a)



grain alcohol is currently limited. Siegel and colleagues (2013), utilizing an Internet panel of youth ages 13 to 20, found that 5.8 percent reported consuming high-alcohol-content grain alcoholic beverages in the past 30 days. Naimi and colleagues (2015) reported that when underage drinkers consume grain alcohol, they are significantly more likely to binge.

Given the dangers of high-potency grain alcohol, some states have banned its sale.³² Improved data on these products, including underage use and related injury, would help policymakers evaluate appropriate responses.

Exposure of Underage Populations to Messages Regarding Alcohol in Advertising and Entertainment Media

The STOP Act requires the Report to Congress to include measures of the exposure of underage populations to messages regarding alcohol in advertising and the entertainment media, as reported by the Federal Trade Commission (FTC). To date, FTC has conducted four formal studies of the exposure of those under 21 to alcohol advertising. In each case, FTC issued compulsory process orders to companies representing 70 percent or more of alcohol marketing dollars and required them to provide demographic data about the audience for each individual ad disseminated during the study period.

These studies have resulted in significant improvements in industry self-regulation over time. For example, FTC's 1999 Alcohol Report revealed that industry self-regulatory codes permitted as much as half of the audience for individual ads to consist of persons under 21. Even then, only half of the companies were able to demonstrate compliance with this weak standard (Evans & Kelly, 1999). The agency recommended that the industry raise its placement standard.

In 2003, FTC reported that the alcohol industry had come into substantial compliance with the prior 50 percent adult standard. More significantly, the agency announced that the alcohol industry had agreed to modify its voluntary codes to require that adults (21+) constitute at least 70 percent of the audience for each individual alcohol ad, based on reliable data. To facilitate compliance, the revised codes of the beer and spirits industries required members to conduct periodic post-placement audits and promptly remedy any identified problems (FTC, 2003).

In its 2008 Report, FTC data showed that 92.5 percent of advertising placements in magazines, newspapers, radio, and television during the study period (the first half of 2005) complied with the 70 percent standard; furthermore, because placements that missed the target were concentrated in smaller media, more than 97 percent of total alcohol advertising "impressions" (individual exposures to advertising) were due to placements that complied with the standard. In total, 86.2 percent of the alcohol advertising audience consisted of legal-age adults (FTC, 2008).

The FTC's 2014 Alcohol Report evaluated industry compliance with the 70 percent standard, as well as Internet and social media marketing. Data for the study period (the first half of 2011) showed that 93.1 percent of the companies' placements in measured media met the 70 percent standard (FTC, 2014; measured media refers to TV, radio, magazine, newspaper, and Internet websites whose audience characteristics, including age, are measured by demographic services).

³²Maryland (MD Code, Art. 2B, § 16-505.2), California (West's Ann.Cal.Bus. & Prof.Code § 23403), and Florida (West's F.S.A. § 565.07) have all enacted such laws.

When data were aggregated across companies and media, 85.4 percent of alcohol advertising impressions (individual ad exposures) were seen by adults (21+), and 14.6 percent were seen by underage persons. The overall audiences for major social media (Facebook, Twitter, and YouTube) exceed 70 percent age 21+; Facebook further limits alcohol ad viewing to people who previously registered as 21+, and Twitter and YouTube offer age-gating technologies. The report also announced that in mid-2011, pursuant to an earlier FTC recommendation, the industry had adopted a 71.6 percent adult audience composition standard for future ad placements (reflecting 2010 U.S. Census data on the percentage of the age 21+ population).

As previously noted, many factors influence youth drinking decisions. Although evidence of a causal relationship is lacking, some research indicates that youth exposure to alcohol advertising is associated with initiation of alcohol consumption by youth and with increased alcohol consumption by youth who drink. A systematic review showed that of 13 longitudinal research studies examined, 12 studies demonstrated an association between youth exposure to alcohol advertising and the initiation of alcohol consumption by youth as well as increased alcohol consumption by youth who had already initiated alcohol use (Anderson, Bruijn, Angus, Gordon, & Hastings, 2009). A more recent review examined 12 different longitudinal studies published since 2008 and found significant associations between youth exposure and alcohol consumption in all 12 studies (Jernigan, Noel, Landon, Thornton, & Lobstein, 2017).

Others have noted that during 2001–2009, youth exposure to alcohol advertising on television in the United States, as measured by gross rating points, increased 71 percent. During the same period, adult (ages 21 to 49) exposure to alcohol advertising on television increased by 64 percent. This is largely attributable to increased alcohol advertising on cable television programs, particularly by distilled spirits companies (Jernigan, Ross, Ostroff, McKnight-Eily, & Brewer, 2013). In 2009, 13 percent of youth exposure on television came from advertising that was noncompliant with the industry’s voluntary placement standards (Center on Alcohol Marketing and Youth [CAMY], 2010; Jernigan et al., 2013).

This had led some advocates to propose additional limits on alcohol marketing. However, as noted by the Surgeon General, studies evaluating the relationship between alcohol advertising and youth consumption typically have not controlled for other factors known to influence underage drinking, such as parental attitudes and drinking by peers. Further, studies have yet to determine whether reducing alcohol marketing leads to reductions in youth drinking (HHS, 2016).

One study estimated that a 28 percent decrease in alcohol marketing in the United States could lead to a decrease in the monthly prevalence of adolescent drinking by 1 to 4 percent (i.e., from 25 percent to between 21 and 24 percent; Saffer & Dave, 2006). A separate study of alcohol advertising bans concluded that “there is a lack of robust evidence for or against recommending the implementation of alcohol advertising restrictions” (Siegfried et al., 2014).

Healthcare Provider Screening for Underage Drinking

Considerable literature has been published indicating that screening, brief intervention, and referral to treatment (often abbreviated as SBIRT), offered by a provider such as a physician, nurse, psychologist, or counselor, can be effective in reducing adolescent drinking and related

problems. Many reviews have been published on this topic (Scott-Sheldon, Carey, Elliott, Garey, & Carey, 2014; Tanner-Smith & Lipsey, 2015).

The importance of SBIRT was recognized by Congress in the 2016 reauthorization of the STOP Act, which authorizes grants to pediatric health care providers to improve the use of SBIRT, including via training and dissemination of best practices (Public Law No. 114-255). The law defines screening as “using validated patient interview techniques to identify and assess the existence and extent of alcohol use in a patient.”

“Brief intervention” is defined as “after screening a patient, providing the patient with brief advice and other brief motivational enhancement techniques designed to increase the insight of the patient regarding the patient's alcohol use, and any realized or potential consequences of such use, to effect the desired related behavioral change.”

Many young people are neither asked by medical providers about their drinking nor advised to reduce or stop drinking. A nationally representative study of 10th graders (the NEXT Generation Health Study) sponsored by the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development found that in the month prior to the survey, 36 percent reported drinking, 28 percent reported binge drinking, and 23 percent reported drunkenness. Of those who saw a physician in the year prior to the survey (82 percent), 54 percent were asked by their medical provider about drinking, 40 percent were advised about related harms, and 17 percent were advised to reduce or stop. Frequent drinkers, binge drinkers, and those who reported having been drunk were more often advised to reduce or stop. Nonetheless, only 25 percent of these individuals received that advice from physicians. In comparison, 36 percent of frequent smokers, 27 percent of frequent marijuana users, and 42 percent of frequent other drug users were advised to reduce or quit those behaviors (Hingson, Zha, Iannotti, & Simons-Morton, 2013).